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AN ANALYSIS OF STAGES AND PROCESSES OF CHANGE AMONG OPIOID ADDICTS IN METHADONE MAINTENANCE TREATMENT

by

Mark Andrew Belding

Department of Psychology
Social & Health Sciences
Duke University

Date: Dec 2, 1993

Approved:

Martin Lakin, Ph.D., Supervisor

Jean Hamilton

Robert D. Levy

Dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in the Department of Psychology: Social & Health Sciences in the Graduate School of Duke University

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ABSTRACT

(Psychology - Clinical)

AN ANALYSIS OF STAGES AND PROCESSES OF CHANGE

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MAINTENANCE TREATMENT

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ABSTRACT

Heroin addiction poses one of the most difficult problems facing mental health practitioners today. Methadone substitution has improved treatment efficacy; however many patients continue to use illicit drugs, drop out of treatment, or both. There is little consensus regarding how to provide effective psychotherapeutic treatment to methadone maintenance patients. Clinicians typically ascribe treatment failures to addicts' poor motivation, however such attributions do little to improve patient care.

This investigation was designed to test and utilize Prochaska and DiClemente's "transtheoretical" model of therapeutic change on a sample of methadone maintenance patients. This model posits that behavior change occurs in a developmental progression characterized by five distinct stages. It furnishes a framework for tailoring interventions to suit the specific needs of patients at different points in the process of recovery.

In Study 1, questionnaires were administered to 276 subjects to assess the following: stages and processes of change with respect to the problem of continuing illicit drug use; recent illicit drug use; demographic characteristics; and strategies for coping with stress. Confirmatory factor analytic procedures were used to test the hypothesized factor structures of the continuous measures and to refine them for subsequent analyses. In Study 2, weekly urine specimens were collected from a sub-sample of Study 1 subjects to measure treatment progress over a three-month follow-up period. In Study 3, interviews of 14 methadone maintenance patients were conducted to provide clinical case examples of the application of the model.

With a few important exceptions, the results were generally consistent with the predictions of the model. The measures identified five relatively distinct stages of

change, each characterized by different intentions and attitudes toward change and by different change processes and coping strategies; however, the predictive power of the model remains to be clearly established. The interview data and the evident relationship between coping measures and drug use point to the need to consider the range of coping deficits that may accompany opiate addiction. The results are discussed in light of the distinct problems posed by opiate addiction and methadone treatment.

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"I prefer not to...
No: at present I would prefer not to make any change at all."

"Bartleby the Scrivener"

Herman Melville

"We have had enough of action, and of motion we,
Rolled to starboard, rolled to larboard, when the surge was seething free,
Where the wallowing monster spouted his foam-fountains in the sea.
Let us swear an oath, and keep it with an equal mind,
In the hollow Lotos-land to live and lie reclined..."

"The Lotos-Eaters"

Alfred, Lord Tennyson

INTRODUCTION

Historically, the problem of opiate addiction has proven extremely resistant to traditional psychotherapeutic approaches. In a recent review, Platt (1986) concluded that "the literature on psychotherapy with heroin addicts is both sparse and unencouraging" (p. 229). Case reports, theoretical writings, and early treatment studies attest to the difficulties of treating opiate addicts (Fenichel, 1945; Savitt, 1963; Nyswander, Winick, Bernstein, Brill, & Kaufer, 1958; Dole, Nyswander, Kreek, 1966). Clinicians have traditionally ascribed a central role in this difficulty to the addict's apparent lack of motivation to change. Rado (1957) characterized the problem as follows: "Generally speaking, the prognosis of narcotic dependence is unfavorable, and the problems of rehabilitation extremely difficult. The crux of the matter is that the patient does not suffer from his illness; he enjoys it" (p. 168). Various authors since then have remarked on the addict's apparent indifference to the host of legal, financial, interpersonal, and health-related problems inextricably linked with chronic drug use and on the difficulty of actively engaging this population in treatment.

The advent of methadone substitution as an adjunct to treatment significantly improved treatment efficacy, resulting in significant reductions in illicit drug use, crime, and related problem behaviors among opiate addicts in treatment. After the initial success of the first methadone maintenance clinics in the early 1960's, methadone maintenance quickly became the most widely utilized from of treatment for opiate addiction in the United States. It has been estimated that more than 100,000 individuals in the United States currently receive methadone maintenance treatment for opiate addiction (General Accounting Office, 1990). The efficacy of this treatment has become

a more urgent concern with the rising rate of heroin use nationally and with the continuing transmission of the HIV virus through intravenous drug use.

While methadone maintenance is arguably the most effective form of treatment for opiate addiction, it is also clear that methadone offers no panacea. Many methadone patients persist in illicit drug use, drop out of treatment, or both. Relatively few successfully detoxify from methadone and the relapse rate is extremely high. It is clear that methadone alone cannot solve all of the drug related problems of opiate users; however, relatively little is known about the non-pharmacologic aspects of treatment or about the client's contribution to the treatment process. In addition to methadone itself, substance-abuse counseling is the primary form of treatment at methadone maintenance clinics. Yet there seems to be no consensus as to what specific approaches are more or less effective. Some patients achieve abstinence from illicit drugs and others fail to show any improvement, but little is known about which strategies or activities promote positive outcomes with which types of patients. And while treatment failures continue to be attributed to poor motivation on the part of the patient, this characteristic reluctance to give up illicit drug use seems to resist empirical study and has received little attention in the opiate addiction research literature.

Working in related areas of addiction treatment, a group of researchers has developed a set of empirically measurable constructs which have shown promise in bringing to light important aspects of the process of therapeutic change and motivation to change, both in and out of treatment (Prochaska, DiClemente, & Norcross, 1992). These constructs are related to an eclectic model of therapeutic change which the authors term "transtheoretical." Their model incorporates elements from a variety of different theoretical orientations and has been refined to reflect empirical findings in several

different populations. On the basis of this research, Prochaska, DiClemente and colleagues argue that therapeutic change can best be understood through the framework of a developmental stage model. According to the model, an individual attempting to modify a particular behavior pattern progresses through a series of five stages beginning with "Precontemplation" and ending in "Maintenance." The earliest stage describes individuals with minimal awareness that they have a problem and no concerns about changing in the near future. By contrast, the last stage describes individuals who have progressed through the intervening stages and who continue working to maintain the changes they have already achieved.

In addition to specific developmental stages, Prochaska and colleagues also identified a set of twelve cognitive and behavioral processes that individuals employ to effect therapeutic change. Prochaska (1979) distilled these processes of change from a comparative review of 18 of the leading schools of psychotherapy. They represent a range of therapeutic activities as diverse as Consciousness Raising (increasing awareness about the existence of a problem in need of change) and Stimulus Control (avoiding the conditioned stimuli which elicit the problem behavior). The model also postulates a relationship between the processes of change and the stages of change. Specifically, each stage of change is characterized by the use of different change processes. Subsequent studies provided empirical support for the hypothesized relationship (Prochaska, DiClemente, & Norcross, 1992). Generally, those in the earlier stages of change are more likely to use processes associated with insight oriented therapies - processes serving to increase understanding of the nature and implications of a particular problem. Individuals in the later stages are more apt to use behaviorally oriented processes which serve to extinguish problem behaviors while facilitating and reinforcing more adaptive ones. Measures for assessing both stages and processes have

evidenced reliability and validity with populations of smokers, psychotherapy patients, alcoholics in treatment, and women enrolled in a weight control program. In several studies, the measures have been shown to predict progress in treatment (DiClemente, Prochaska, Fairhurst, Velicer, Velasquez, & Rossi, 1991; Prochaska, Norcross, Fowler, Follick, & Abrams, 1992).

This model holds the potential for improving methadone maintenance treatment in that it provides a framework for determining which kinds of interventions may be more effective at different points in the process of recovery. For example, if the model can be applied to this population, individuals in the early stages who are not yet entirely committed to altering behavior should benefit most from interventions aimed at helping them evaluate the consequences of their drug use and raising their awareness of the problem. Those in the later stages who are more invested in changing their behavior may be more likely to benefit from more directive interventions aimed at encouraging them to take concrete steps such as altering their environments or changing patterns of behavior associated with illicit drug use.

The present study was designed to first validate and then utilize measures derived from the "transtheoretical model" on a sample of methadone maintenance patients to examine an essential part of the treatment process - namely the extent to which the methadone patient is prepared to give up illicit drug use and the steps these patients take to effect this change. The study was designed to provide evidence for further assessing the generalizability of previous findings as well as providing a means for addressing some of the following questions. Are there identifiable differences in treatment readiness among methadone patients? Are there identifiably different levels of involvement in treatment and if so, are they correlated with success in remaining

abstinent from illicit drugs? Do those methadone patients who have maintained long-term abstinence from illicit drugs see themselves as actively involved in the maintenance process or do they see themselves as no longer having the problem of drug addiction? Answers to such questions should ultimately aid in the provision of more individualized and more effective treatment for opiate addicts.

Modified versions of two stage measures and one process measure were administered to a sample of 276 methadone maintenance patients along with a demographic questionnaire and a measure of strategies for coping with stress. Confirmatory factor analytic procedures were used to assess the validity of the hypothesized factor structures of the continuous measures and to produce valid measures for use in subsequent analyses. Relationships among the measures were analyzed to examine the characteristics associated with each of the stages of change. On a subset of the sample (n = 43), the next phase of the study assessed the extent to which the measures relate to treatment progress as measured by weekly urine drug screen results collected over a three-month follow-up period. Finally, clinic records and psychosocial interviews with a smaller sub-sample (n = 14) provided a means for assessing in greater depth the strengths and weaknesses of the stage and process measures and their correspondence with qualitative clinical data.

BACKGROUND OF THE STUDY

METHADONE MAINTENANCE TREATMENT

History and Efficacy

Dole and Nyswander established the first methadone clinic in the United States in 1963 as part of a research pilot project. They sought to demonstrate the effectiveness of methadone as pharmacologic agent which would both prevent withdrawal symptoms and block the euphoric effects of heroin (Dole, Nyswander, & Kreek, 1966). They found that a single daily dose of methadone produced cross-tolerance to other opioids such as heroin. A patient in methadone maintenance receives an orally administered daily dose of methadone which is gradually increased until a level of tolerance is established which renders the patient relatively insensitive to the euphoric effects of narcotic drugs. The patient's incentive to use illicit opiates is presumably reduced because these drugs no longer produce the same euphoric effects. At the same time, since methadone is long-acting, a single daily dose minimizes withdrawal symptoms, helping to stabilize mood and physical state. The addict on methadone is no longer compelled to cycle several times daily between feeling "sick," using illicit opiates, and becoming "high." This, in turn, enables the addict more successfully to fulfill his various responsibilities and to deal with everyday problems of living (e.g., maintaining employment, relationships, etc.). By relieving the addict of the burden of financing an expensive illicit opiate habit, methadone treatment also removes an important incentive for illegal activity.

Dole, Nyswander, and Kreek (1966) initially reported great success with their methadone maintenance program, noting dramatic reductions in drug use and related

behavior. Twenty-seven months after opening their pilot program in New York, they reported that 114 of the 128 (89%) chronic heroin users who had been admitted to their pilot program remained in treatment. As another measure of their success, they reported a 17% unemployment rate among patients on their program for three or more months as compared with 83% before treatment. In a later study, Dole, Nyswander, and Warner (1968) found an 89% decrease in the rate of convictions after patients entered treatment, suggesting a significant decrease in criminal behavior.

More recent research continues to support the efficacy of methadone maintenance in reducing illicit drug use, criminal behavior, unemployment, and risk of HIV infection among opiate users (for review, see Allison & Hubbard, 1985; or Senay, 1985). However, in general, the positive results have been less impressive than those originally obtained by Dole and Nyswander. While Simpson (1979) demonstrated that methadone maintenance treatment results in more positive outcomes than either no-treatment or short-term detoxification, particularly for those patients who remain in methadone treatment for more than 300 days, only 47% of the 821 men in the sample remained in treatment for that period of time. In their survey of six different methadone clinics in three eastern cities, Ball, Lange, Myers, & Friedman (1988) found great variability in treatment effectiveness. Rates of current intravenous drug use ranged from less than 10% to greater than 50% across clinics. Recent review of clinic records at one of the sites for the present study revealed that 25 of 78 methadone patients (32%) had used illicit opiates in the previous 30 days and 50% had used some other illicit drug or combination of drugs.

The contrast between the extremely high rates of success reported initially and the more modest results of later studies has been attributed to several factors. The staff

for the pilot project were highly trained and enthusiastic while the patients were carefully selected to be relatively free from significant psychological or substance abuse problems other than opiate addiction (Woody, McLellan, Luborsky, & O'Brien, 1990). Even in this relatively select group of patients, Dole and Nyswander (1967) recognized the magnitude of the obstacles to recovery and the need for thoroughgoing rehabilitative treatment in addition to medication. The pilot project provided intensive multi-disciplinary treatment and also required an initial six weeks of inpatient hospitalization during which patients were stabilized on methadone. The hospital stay removed patients from the environments in which illicit drugs were readily available and provided a level of structure and staff attention not available in today's outpatient methadone clinics. Methadone maintenance programs proliferated after the success reported by Dole and Nyswander; however, the quality of service provided by these clinics varies widely and today's addicts, many of whom abuse a variety of substances besides opiates, evidence more extensive problems than the first methadone patients (Woody, et al., 1990).

Obstacles to Effective Treatment

Opiate use is associated with a host of problems not directly addressed by the phramacologic action of methadone. Drug use pervades every aspect of the lives of many addicts, providing a kind of structure for daily activities and replacing other means of coping with life stresses. It may numb emotions and lead addicts to neglect important aspects of their own lives and their relationships with others. Moreover, in addition to polysubstance abuse or dependence, many if not most opiate addicts also experience significant psychological problems such as depression and personality disorders which may contribute to their continuing drug use (Khantzian & Treece, 1985; Kosten & Rounsaville, 1986). The burden of responsibility for helping the methadone patient

with this staggering array of difficulties falls to the substance abuse counselor. Yet many counselors may be minimally trained, inadequately supervised, and poorly paid. Indeed, no adequate standards exist for the training of the substance abuse counselors (Senay, 1985). Nonetheless, they are expected to treat patients who have been characterized as "some of the most disturbed individuals in the mental health care system" (Woody, et al., 1990, p. 10).

Even the most qualified and enthusiastic methadone counselor confronts another difficulty not encountered to the same degree in other areas of outpatient psychological treatment. Many of those who apply for methadone maintenance may have no interest in the services the counselor is prepared to provide. They may seek medication without necessarily identifying their drug problem as in any way amenable to psychological treatment. They may have no intention of giving up drugs or of making the kinds of drastic changes necessary to overcome addiction. As one writer put it: "Because methadone alone is very attractive to patients, commitment to working on life-style changes may be very difficult to assess..." (Zweben, 1991, p. 177). Sometimes patients express their lack of commitment to treatment rather clearly as illustrated by a recent incident at the clinic where the author serves as clinical director. A very qualified counselor on the staff recently began to treat a patient who had transferred from another clinic. The patient, a regular abuser of illicit drugs, was confused and irritated by the counselor's attempts to schedule weekly counseling sessions. When he finally did meet with his counselor, he protested: "I've been on methadone for 15 years and have never been in counseling; I've never needed it."

Counseling and Psychotherapy

Despite the difficulties outlined above, several studies provide some evidence that the efficacy of methadone maintenance can be improved by supplementing methadone substitution with some form of psychotherapeutic treatment; however it has not been established which specific types of interventions are most effective. Two major studies of the efficacy of psychotherapy for methadone maintenance patients produced contradictory results. Rounsaville, Glazer, Wilber, Weissman, & Kleber (1983) designed a study to test the efficacy of short-term interpersonal psychotherapy as provided by either a psychologist or psychiatrist. They found that patients who participated in six months of weekly psychotherapy sessions fared no better on measures of outcome than patients assigned to a control group who received minimal therapist contact.

On the other hand, Woody, et al. (1983) found that methadone maintenance patients who received at least three sessions of professional psychotherapy (either supportive-expressive or cognitive-behavioral) in addition to conventional drug counseling fared better at seven month follow-up than those who received counseling alone. Those who received psychotherapy showed greater improvement on several measures including amount of illicit drug use, amount of criminal behavior, and scores on the Symptom Checklist - 90. They also required lower doses of methadone and fewer ancillary medications (such as antidepressants or anxiolytics) than those who received drug counseling alone. Neither type of psychotherapy outperformed the other on these measures.

The differences in outcome between these studies have been attributed to several factors. First, in addition to the experimental treatment, all patients in the first study also received weekly group psychotherapy and individual drug counseling on an as-needed basis - relatively intensive treatment by the standards of most methadone clinics. It is possible that the benefits of individual psychotherapy were washed out by the effects of the standard treatment regimen. The study was also plagued by problems with recruitment and attrition highlighting the problems of motivation outlined above. Only 5% of eligible patients agreed to participate and of these, roughly half completed the six months of treatment. Noting both the difficulty and importance of actively engaging patients in treatment, Woody and colleagues insured that therapists in their study made special efforts to this end including actively following up missed appointments. Even with this effort, only about 36% of recruited patients met the minimum standards for inclusion in the study which required only that they attend three therapy sessions in the first six weeks of treatment.

Of course drug counseling - not psychotherapy - constitutes the most readily available form of treatment at methadone maintenance clinics and drug counseling is not necessarily the same as psychotherapy. Putting aside for a moment the problematic issue of defining what drug counseling <u>is</u>, at least one study suggests that this form of treatment, too, can have a significant impact on methadone maintenance treatment efficacy. McLellan, Woody, Luborsky, and Goehl (1988) made use of a naturally occurring situation to examine the effects of counselor assignment in a methadone maintenance program. After the unexpected resignation of two drug counselors, 61 patients from their caseloads were reassigned to four other counselors at the clinic. Assignments were not strictly random, but they were made quickly with little or no knowledge of the patients and no attempt to match clients to counselors. Retrospective

examination of clinic records revealed that counselor assignment resulted in significant differences in treatment progress over the following six months. Patients transferred to one counselor achieved significant reductions in illicit drug use, unemployment, and number of arrests while concurrently reducing their average methadone dose. In contrast, patients transferred to another counselor evidenced increased unemployment and illicit drug use while their average methadone dose went up.

It is not clear which aspects of the counseling process accounted for these differences, though examination of the counselors' charts suggested that the least effective counselors were inconsistent in their enforcement of program rules, somewhat disorganized in their documentation of treatment, and saw their patients relatively infrequently averaging slightly more than one session per month. They also failed to provide a clear rationale for referrals to program physicians or changes in methadone dose. The most effective counselor, in contrast, saw patients more frequently (at least weekly in most cases) and documented clear treatment plans. Perhaps more importantly, this counselor also provided treatment which the authors describe as similar to psychotherapy in that it focused on "the development of new behaviors and new ways of thinking on the part of the patient" (p. 429). While the study results do not support many specific recommendations regarding the counseling process, they do at least suggest that counseling can make a difference.

But what exactly is drug counseling and what distinguishes it from psychotherapy? Citing the lack of knowledge on the topic, one group of researchers refer to methadone counseling as a "black box" (Burt, Brown, & Dupont, 1980). In fact no clear standards exist for the practice of drug counseling in a methadone clinic. FDA regulations provide guidelines regarding documentation of treatment and frequency

with which treatment plans must be revised but say little or nothing about what the counselor and patient are supposed to do in counseling nor even how frequently they should meet (Office of the Federal Register, 1989). State regulations vary but may provide little more in the way of clarification of the counselor's role. In New Jersey, for instance, state regulations dictate that a counselor's caseload shall not exceed 50 patients; the regulations also specify the number of counseling sessions a patient is supposed to receive. This number varies from one per week in the first month of treatment to one session every three months after completion of two or more years of treatment (New Jersey Department of Health, 1985). However, the regulations furnish no guidelines regarding even the length of counseling sessions. And as for a definition, the regulations provide only the following vague tautology: "Drug abuse counseling services shall mean the provision of individual, group, family, and/or vocational counseling" (p. 45).

In descriptions of their studies, Woody and colleagues specify a relatively clear definition of the drug counseling provided in their research clinic (e.g. Woody, et al., 1983; Woody, McLellan, Luborsky, & O'Brien, 1986). They indicate that drug counseling focuses primarily on the provision of concrete services and the monitoring of illicit drug use. They describe a typical counseling session as follows:

> ...a counselor meets with a patient, reviews the clinic chart, and observes that the urine tests show opiates. He questions the patient regarding what has been happening and how he is feeling. The patient says his methadone dose is not yet high enough, that he is having withdrawal symptoms... and that he has been using heroin. The counselor then arranges for the patient to meet with a program physician, who evaluates the need of an increase in methadone dose.

At the same time, the patient mentions that he has a court appearance in two weeks and requests a note for the judge saying that he is participating in a treatment program. The counselor has the patient sign a release of information statement, prepares a note, and then gives it to the patient to take to his lawyer." (Woody, et al., 1983, p. 640)

Woody et al. emphasize the liaison functions of the counselor whose role it is to arrange meetings with clinic professional staff (e.g. a program physician) and to help the client obtain necessary social or legal services. They note the external focus in counseling which distinguishes it from psychotherapy which "attempts to identify and alter internal psychic processes that are creating or contributing to difficulties that the patient is experiencing" (Woody, et al., 1986, p. 552).

However, despite the relative clarity and specificity of these descriptions, it is rather apparent that they do not adequately capture all of the types of interventions employed in the actual practice of drug counseling. In fact, their own study, cited previously (McLellan, et. al., 1988) suggests that more effective counselors do more than provide the externally focused treatment described above, while the least effective counselors may do less. In fact, it is not uncommon for counselors with limited clinical skills to resort to punitive measures and power tactics or angry, shaming confrontations in their attempts to coerce resistant patients into giving up illicit drug use (Zweben, 1991; Miller & Rollnick, 1991), though there is no evidence to support the effectiveness of such techniques (Miller & Rollnick, 1991).

Zweben (1991) suggests that since professional psychotherapy is expensive and generally unavailable at methadone clinics, counselors themselves must be prepared to provide more clinically sophisticated treatment to their patients. Indeed the drug

counseling she describes is rather indistinguishable from psychotherapy. She suggests that counselors should be trained to provide family therapy, utilize Gestalt techniques, and help their patients deal with the sequelae of childhood sexual abuse. This kind of treatment is certainly a far cry from the quarterly vocational counseling which would meet the minimum state requirements for long-term methadone patients in the state of New Jersey or even from the provision of concrete services described by Woody and colleagues.

The diverse practices of methadone counselors are difficult to characterize and clinicians disagree as to how this counseling should be practiced. The question of what kinds of interventions are most effective for which kinds of patients remains largely unanswered. There is great variability in the quality, intensity and frequency of the services provided by counselors. In many cases, clients may be seen relatively infrequently and for brief periods of time. These conditions suggest that, for many patients, any therapeutic change not directly attributable to the methadone itself may be accomplished somewhat adventitiously and may even bear little relation to counseling per se. Nonetheless, if it can be established that a stage characterization adequately describes an addict's progress towards abstinence and, further, that those patients who achieve better outcomes utilize specific processes at different stages of recovery, this knowledge may provide a basis for designing more effective treatments. This is true regardless of whether or not progress is related to treatment as it is currently provided. For a given patient at a given stage, it may be possible to design treatments aimed at actively promoting the processes of change associated with movement to the next recovery stage. These are the practical, clinical implications of the "transtheoretical model" and of the present investigation.

THE TRANSTHEORETICAL MODEL

Though much of the early empirical work of Prochaska and DiClemente was done on smokers, their model is intended to describe change activity with respect to just about any kind of behavioral or emotional problem, from overeating to symptoms of personality disorder (Prochaska & DiClemente, 1984). In addition, recognizing that many individuals change problem behavior patterns without benefit of treatment, Prochaska et al. incorporated into their research, studies of self-initiated change as well as studies of change facilitated by therapy (e.g. DiClemente & Prochaska, 1982; Prochaska & DiClemente, 1983). On the basis of these studies, they argue that the same principles and processes may be used to describe the phenomenon of intentional change both in and out of treatment.

The notion of developmental stages of change derives from Prochaska and DiClemente's early empirical work on smoking cessation in which they noticed that attempts to quit seemed to be characterized by distinct shifts in attitude and behavior and that people at different points in the change process seemed to engage in different activities to facilitate change. They developed the model by combining their own findings with elements from previously existing stage models including Janis' model of the decision making process (Janis, 1968) and Horn's outline of stages in the process of smoking cessation (Horn, 1976). The current model incorporates five stages which individuals move through in the course of modifying a particular set of behaviors: 1) Precontemplation; 2) Contemplation; 3) Preparation; 4) Action; 5) Maintenance.

Precontemplation is the earliest stage in the process. Individuals in this stage have "no intention to change behavior in the foreseeable future." (Prochaska, DiClemente, Norcross, 1992; p. 1103). They may be unaware of their problems, and

when they appear in therapy, it is often because they feel coerced by loved ones, employers, or the legal system. Methadone maintenance patients in this category would consist of those who have no sincere desire to give up illicit drug use but wish, instead, to temporarily supplement their street drug use with a relatively inexpensive opioid. Individuals may remain in the Precontemplation stage indefinitely, though if they begin to think seriously about changing, they may be considered to have progressed to the Contemplation stage.

Prochaska et al.(1992) define Contemplation as "the stage in which people are aware that a problem exists and are seriously thinking about overcoming it but have not yet made a commitment to take action." (p. 1103) Many methadone maintenance patients seem to fit this category; they may attend counseling sessions with some vague desire to change some aspect of their situation, but they do not follow through on recommendations to take steps to reduce illicit drug use. They may, for example, continue to keep a syringe at home or continue to associate with a group of acquaintances whom they have identified as likely to encourage continued drug use. Individuals in this stage may regress back to Precontemplation, remain in Contemplation, or they may move into the Preparation stage.

Preparation includes elements from the previous and following stages. Individuals in the Preparation stage have the intention to change and have begun to take steps. For example, they may have made recent unsuccessful attempts at abstinence from cigarettes or alcohol. The Preparation stage was omitted from the model for seven years because it failed to be supported by principal components analyses of the continuous measures of change (Prochaska, DiClemente, & Norcross, 1992), however cluster analyses of data gathered from several populations suggests that the Preparation

stage well describes the orientation of certain groups of people toward the change process. Most of those seeking admission to a methadone clinic with the sincere desire to give up illicit drug use would probably fall into this category. The act of applying for admission constitutes a step toward change; the question for such individuals is whether they will sustain change activity, or, instead, become complacent and relapse to an earlier stage, perhaps after achieving some reduction in a costly drug habit. In the context of a counseling session, it might be difficult to distinguish this stage from the earlier stages, since most patients, responding to institutional pressures, are unlikely to state candidly that they have no intention of quitting in the near future. In most clinics, such a statement would put a patient's future treatment (and future supply of methadone) in jeopardy.

The Action stage describes the period during which "individuals modify their behavior, experiences, or environment in order to overcome their problems." (Prochaska, DiClemente, & Norcross, 1992; p. 1104). The empirical work of Prochaska and colleagues suggests that for addictive behaviors, the Action stage lasts approximately six months. The Action stage might characterize those patients who, after admission, faithfully attend counseling sessions and successfully work to discontinue their use of drugs other than methadone. Others who might fall into this category are those patients who, after a period of complacency, begin once again to take steps toward quitting, perhaps motivated by an effective counselor or by the threat of administrative discharge from the program as a consequence of continued drug use.

The final developmental plateau in the model, the Maintenance stage, is defined as "the stage in which people work to prevent relapse and consolidate the gains attained during action" (Prochaska et al., 1992, p. 1104) This stage may be considered to last

indefinitely for some behaviors. It may characterize the attitudes and behavior of those methadone maintenance patients who have achieved abstinence from illicit drugs for six months or more and who continue to take steps to prevent relapse. Experience suggests that, in addition to these patients, there may be different group of successfully abstinent patients who seem no longer to consider themselves addicts. These are the patients who evidence a desire to deny or forget that they ever used illicit drugs and who have as little contact with the clinic as possible. While such individuals are maintaining abstinence from drugs besides methadone, it remains to be seen whether they consider themselves as actively engaged in working to prevent relapse.

Ideally, an addict would move through the stages in swift linear progression. However, in practice, most addicts do not sustain abstinence from an addictive behavior in their first attempt, and relapse to an earlier stage is possible at any point in the process. Thus an individual who has begun to make preparations to change may not be able to sustain any change activity and may move back into Contemplation. Similarly, an individual who has successfully maintained a change in behavior may experience a relapse as an overwhelming failure accompanied by feelings of shame and embarrassment. Such an individual may turn away from thinking about the problem and return to the Precontemplation stage.

In combination with the stages of change, the processes of change represent an attempt to build a framework for integrating the most useful and worthwhile aspects of divergent systems of psychotherapy (Prochaska & DiClemente, 1984). Believing that most systems of psychotherapy have some merit, Prochaska (1979) originally used the notion of change processes to provide a means for comparing the practices espoused by different theoretical orientations. In this book, he reviews and compares nine different

general types of psychotherapy: 1) psychoanalysis; 2) existential analysis; 3) client-centered therapy; 4) Gestalt therapy; 5) Adlerian therapies; 6) rational-emotive therapy; 7) transactional analysis; 8) emotional flooding therapies; 9) behavior therapy.

He noted that all of these therapies aim at engaging the patient in some kind of change activity though schools of therapy differ in the specific types of activity they promote. Thus, psychoanalytic techniques encourage patients to develop cognitive and emotional insights into the unconscious motivations for their behaviors - a form of Consciousness Raising. Behavioral therapies, in contrast, are geared toward helping patients to develop new contingencies of reinforcement to promote more adaptive behaviors (Contingency Management) or toward breaking the association between a conditioned stimulus and a problem behavior (Counterconditioning). Other schools of therapy might employ different combinations of these processes of change. Rational-emotive therapy, for example, might explicitly foster Consciousness Raising and Contingency Management.

In his early formulation, Prochaska (1979) identified eleven different process. Subsequent research resulted in slight modification of the original processes and the addition of one or two. The research indicates that between 10 and 13 process of change can be reliably identified and that these processes are utilized by individuals attempting to overcome a variety of problems from smoking cigarettes to psychological distress (Prochaska, DiClemente, & Norcross, 1992). Figure 1.1 represents a recently updated overview of the twelve processes of change as they apply to individuals participating in a weight control program.

Processes	Definition: Interventions
1. Consciousness raising	Increasing information about self and problem: observations; confrontations; interpretations; bibliotherapy.
2. Self-reevaluation	Assessing how one feels and thinks about oneself with respect to a problem: value clarification; imagery; corrective emotional experience
3. Self-liberation	Choosing and commitment to act or believe in ability to change: decision-making therapy; New Year's resolutions; logotherapy techniques; commitment enhancing techniques
4. Counterconditioning	Substituting alternatives for problem anxiety related behaviors: relaxation; desensitization; assertion; positive self-statements.
5. Stimulus control	Avoiding stimuli that elicit problem behaviors: adding stimuli that encourage alternative behaviors; restructuring one's environment (e.g., removing alcohol or fattening foods); avoiding high risk cues; fading techniques.
6. Contingency management	Rewarding oneself or being rewarded by others for making changes: contingency contracts; overt and covert reinforcement; self-reward.
7. Helping relationships	Being open and trusting about problems with someone who cares: therapeutic alliance; social support; self-help groups.
8. Dramatic relief	Experiencing and expressing feelings about one's problems and solutions: psychodrama; grieving losses; role playing.
9. Environmental reevaluation	Assessing how one's problems affect physical environment: empathy training; documentaries.
10. Social liberation	Increasing alternatives for nonproblem behaviors available in society: advocating for rights of repressed; empowering; policy interventions.
11. Interpersonal control	Avoiding people or social situations that encourage problem behavior: seeking people or situations that encourage healthier behavior; restructuring social relationships (e.g., less socializing around food).
12. Medication	Use of prescribed or nonprescribed substances directed at appetite (e.g., suppressants), metabolism (e.g., nicotine), or emotions (e.g., alcohol or anti-anxiety agents).

Figure 1.1. Definitions of twelve processes of change as they apply to individuals participating in a weight control program (from Prochaska, Norcross, Fowler, Follick, & Abrams, 1992, p. 37).

On the basis of their research, Prochaska and colleagues determined that individuals at different stages of change differentially utilize different processes of change to modify their behavior. It makes sense intuitively that not all individuals presenting for treatment are prepared to take direct action (e.g. complete homework assignments, implement behavioral plans, etc.). In fact empirical studies suggest that individuals in the earlier stages of change are less likely to engage in action-oriented processes such as stimulus control, counterconditioning, and reinforcement management than those in the Action stage. Conversely, those in the earlier stages are likely to make more use of processes which involve evaluating themselves, their problems, and their situation - processes such as consciousness raising, self-reevaluation, and environmental reevaluation. The results of these and other findings are summarized in Figure 1.2 which illustrates how different processes mediate the shifts between different stages.

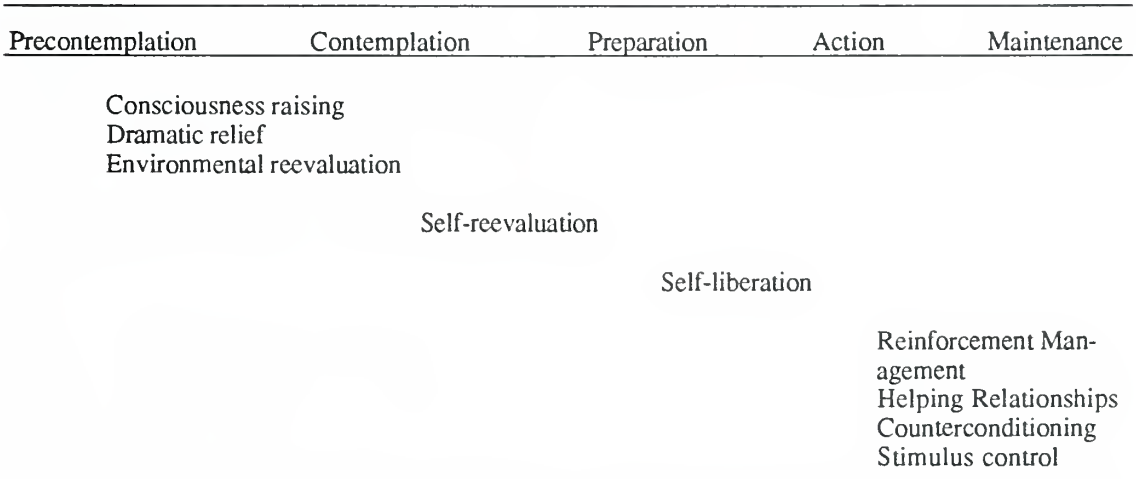

Figure 1.2. Processes of change associated with each of the stages of change (from Prochaska, DiClemente, & Norcross, 1992, p. 1109).

Three of the 12 processes are not included in the table. Social Liberation is not associated with any particular stage, and seems to be defined differently in different

publications. In general, it seems to mean acting to increase opportunities to choose a non-problem behavior such as advocating for the rights of non-smokers, though it can also mean simply being aware of these increased opportunities. The specific activities included under this heading vary from noticing no-smoking areas (Prochaska, Velicer, DiClemente, & Fava, 1988) to participating in structural family therapy aimed at altering rigid family patterns (Prochaska & DiClemente, 1984). Interpersonal Control was added to the model relatively recently, and its association with a particular stage has not been established. Since it seems to be a specific form of Stimulus Control, presumably it would be utilized by individuals in the Action and Maintenance stages. Use of Medication was added to the weight control study not so much as a process of change but as a measure of a maladaptive means of coping (Prochaska, Norcross, Fowler, Follick, and Abrams, 1992). As such, it would presumably be associated with the earlier stages of change. To the extent that they take methadone, of course all addicts in methadone treatment utilize medication. However, some addicts may utilize drugs or alcohol in addition to methadone to reduce their use of some other drug. One would assume that this process would be associated with an early stage of change.

STRENGTHS AND LIMITATIONS OF THE MODEL

Prochaska et al. use the term "transtheoretical" to describe their model because they view it as an integration and synthesis of psychotherapeutic orientations. Acknowledging what has been criticized as the superficiality and fragmentation of many models of eclecticism, they sought to devise a framework for "a more systematic eclecticism" (Prochaska & DiClemente, 1984, p. 2). However, as it is operationalized, the model cannot do justice to the richness and complexity of therapeutic techniques employed by those of any one particular school. The simplification required by

reducing therapeutic change to ten or twelve processes results in the lumping together of very diverse kinds of activities. Thus for example, Consciousness Raising might include reading a popular self-help book, accepting the confrontation of an ex-addict counselor, or understanding the Oedipal interpretation of a classical psychoanalyst. The stages and processes do not provide a means for distinguishing among the kinds of information provided in the thousands of self-help books available, nor among different types of interpretations described in the volumes written on psychoanalytic technique. The model also cannot distinguish between more and less effective techniques which may be aimed at promoting the same process. For example as any clinician knows, there are different types of helping relationships, and some are more helpful than others. The model does not provide principles for the establishment of a therapeutic helping relationship.

The model does not constitute a theory of personality or of psychopathology nor was this the intention of those who developed it. However, since it does not really address theoretical differences between orientations, it achieves a rather uneasy integration. To a Rogerian therapist, empathic listening and unconditional positive regard constitute essential aspects of treatment. In the language of the model, these techniques aid in building the helping relationship, facilitating dramatic relief, encouraging self liberation, and reevaluation of self and environment. On the other hand, a hard-core behaviorist may see such techniques as simply inappropriately reinforcing the patient's complaining. The behaviorist would likely use different techniques to foster some of the same processes - techniques which the Rogerian might see as controlling and authoritarian. It is not entirely clear that such disputes could be resolved through the model.

The model does provide an overall strategy and rationale for the application of a variety of different types of intervention techniques. As such it may have some utility for guiding the treatment provided by methadone clinic staff who typically have little formal clinical training. Miller & Rollnick (1991) have incorporated the model into a treatment approach for "unmotivated" patients. In this approach, the notion of Precontemplation provides a way of reframing the behavior of the patient who does not respond to the typically active and directive approaches of many addiction treatment programs. Use of such an approach could help the counselor to focus on helping resistant patients to determine whether they want treatment rather than attempting to coerce or cajole the patient into complying with a treatment program in which he has no investment. Cognitive and behavioral interventions, increasingly popular in the research literature, seem to assume that the client wishes to discontinue drug use and devote themselves to providing the client with strategies for achieving this goal. Recognition of different levels of readiness for treatment and the incorporation of interventions aimed at those in the earlier stages may help to reduce treatment drop out in such programs.

One of the greatest strengths of the model is that it lends itself to empirical measurement and has demonstrated construct and predictive validity in several studies. This stands in sharp contrast with other constructs which address different aspects of treatment motivation such as "denial", "treatment expectations", or "attitudes toward treatment." Such constructs are difficult to define and have not been shown to be meaningfully related to treatment progress or outcome (see for example O'Leary, Rohsenow, Schau, & Donovan, 1977; Duckro, Beal, & George, 1979; and Nurco, Shaffer, Hanlon, Kinlock, Duszynski, & Stephenson, 1988).

What follows is an overview of the measures related to the model and the evidence supporting their empirical validity.

MEASURES

Stage Measures

Status with respect to stages of change has been assessed in two different ways. One method utilizes a questionnaire yielding continuous scores on 4 separate subscales. The other method involves an algorithm incorporating subjects' answers to simple questions about their current status with respect to the problem behavior, recent attempts to change, and intentions to change. With slight variations, this method has been used in several studies to classify smokers in the stage model. The algorithm for smokers classifies as Precontemplators those current smokers who state that they have no intention of quitting in the next six months (DiClemente, Prochaska, Fairhurst, Velicer, Velasquez, & Rossi, 1991). Contemplators are defined as those current smokers seriously considering quitting in the next six months. Current smokers who are seriously considering quitting in the next 30 days, and who have made a 24-hour quit attempt in the past year are categorized in the Preparation stage. Former smokers who are not currently smoking and have quit within the past six months are classed in the Action stage. Former smokers are classed in the Maintenance stage if they are not currently smoking and have not smoked in more than six months. The stages defined by the algorithm are exhaustive and mutually exclusive. All addictive smokers and former smokers qualify for one and only one stage at any given time. A version of the

stages of change algorithm has also been used to assess cocaine users in the process of attempting to stop cocaine use (Rosenbloom, 1991).

The continuous measure provides a profile of scores on four subscales. Its development is described in McConnaughy, Prochaska, & Velicer (1983). The authors started with 165 items designed to relate to the five stages of change outlined in the transtheoretical model. These were sorted into five categories by three graduate student raters and only the 140 items on which they reached 100% agreement were kept. Of these, 125 were retained, twenty five per stage. Each item is rated on a five point Likert scale of agreement. This reduced measure was completed by 155 adults applying for outpatient counseling or psychotherapy in a variety of settings. Factor analyses were used to further reduce the number of items. The factor designed to measure Preparation failed to be supported by the analyses, so those items were also eliminated. The final measure consists of the eight highest loading items per stage for a total of 32 items. Principal components analysis of the final 32-item version of the questionnaire yielded four well defined factors, each with exactly eight high-loading items.

Sample items from the four subscales (McConnaughy, DiClemente, Prochaska, & Velicer, 1989) are listed below:

Precontemplation:

1. As far as I'm concerned, I don't have any problems that need changing.
26. All this talk about psychology is boring. Why can't people just forget about their problems.

Contemplation:

2. I think I might be ready for some self-improvement.

19. I wish I had more ideas on how to solve my problem.

Action:

3. I am doing something about the problems that had been bothering me.

14. I am really working hard to change.

Maintenance:

6. It worries me that I might slip back on a problem I have already changed, so I am here to seek help.

28. It is frustrating, but I feel I might be having a recurrence of a problem I thought I had resolved. (pp. 502-503)

The factor structure of the measure was confirmed in a second study of 327 adults entering outpatient psychotherapy at a state psychiatric facility (McConnaughy, et al., 1989). Principal components analysis essentially replicated the earlier findings. The authors also note that the means and standard deviations of the subscales were very similar to those obtained with the original sample as were the correlations between the various measures. Each subscale is most closely correlated with the subscales adjacent to it in the model, supporting the notion that change involves a predictable movement from one stage to the next. The same factor structure was confirmed in a different population when 224 adults applying for outpatient alcoholism treatment completed the measure (DiClemente & Hughes, 1990).

Process Measures

The questionnaire assessing processes of change was originally developed for use with smokers, though it has been modified for use in other populations as well. Prochaska, Velicer, DiClemente, & Fava (1988) describe the development and validation of the measure. Prochaska's (1979) original conception of the processes of change included five processes of change which could each be applied either to one's own experience or to one's environment to yield a total of ten processes (Prochaska, Velicer, DiClemente, & Fava, 1988):

Consciousness Raising	Feedback, Education
Choosing	Self-Liberation, Social Liberation
Catharsis	Corrective Emotional Experience, Dramatic Relief
Contingency Control	Reevaluation, Contingency Management
Conditional Stimuli	Counter Conditioning, Stimulus Control

(p. 521)

In constructing the measure, Prochaska and colleagues expanded Contingency Control to include both a cognitive and a behavioral process. The cognitive process - termed Cognitive Restructuring - included Self-Reevaluation and Environmental Reevaluation. The behavioral component - termed Contingency Management - included Self-Management and Social Management. In addition, the author's added one final process - namely the Helping Relationship - which they did not break down into two components. Indeed, it is difficult to determine how this process could be further divided, since experiential and social components would seem to be inherently and inextricably combined in the helping relationship.

To develop the smoking questionnaire, the authors generated an initial pool of items which were sorted into categories representing each of the 13 processes. Four trained judges sorted the items, and 65 items on which the judges agreed were retained, five for each process. The 65 items were randomly ordered and administered to two samples of subjects (n = 510 and n = 460) responding to newspaper ads in different geographical locations Subjects rated each item on two five-point Likert scales, one measuring how frequently a process was utilized and the other measuring the helpfulness of a process in the effort to quit smoking. Subjects were asked to respond to the items regarding 1) their last quit attempt and 2) their current behavior. The data from the resulting four versions of the questionnaire were then each factor analyzed separately for each of the two samples, yielding eight sets of very similar results.

The authors settled on a ten-component solution as the most interpretable. Seven of the original 13 processes were each clearly represented by a single component: 1) Counterconditioning, 2) Stimulus Control, 3) Environmental Reevaluation, 4) Social Liberation, 5) Dramatic Relief, 6) Helping Relationship and 7) Self-Liberation. Three additional components consisted of combinations of items from the remaining original scales. Items from the experiential and educational components of Consciousness-Raising combined to form a single component labeled Consciousness Raising. Self-reevaluation and Corrective Emotional Experience items combined to represent, in the view of the authors, cognitive and affective components (respectively) of a single scale labeled Self-reevaluation. A final weakly identified component consisted of items from the original Self-management and Social Management of Reinforcements. These items seemed to represent the provision of rewards by self and others for not smoking and was eventually labeled Contingency Management. In order to determine whether subjects' scores on the various scales may have been influenced by social desirability,

the authors administered the Jackson Desirability Scale (Jackson, 1967) to a subset of 250 subjects. The correlations between this measure and the 10 process subscales were slight, varying from .01 to -.15, suggesting no significant confound with social desirability.

Both versions of the questionnaire (helpfulness and frequency of use) apparently yielded very similar responses; however the authors report detailed statistics on only the helpfulness version of the retrospective questionnaire and the frequency version of the questionnaire regarding current behavior. For a given reference period, the correlations among the subscales were generally relatively low (around .30) suggesting substantial independence among the subscales; however, there was quite a bit of variation among the correlation coefficients. For example, on the current (frequency) measure, Self-Reevaluation correlated at or above .50 with four of the remaining nine subscales: Consciousness-Raising, Self-Liberation, Dramatic-Relief, and Counter Conditioning. The authors performed a confirmatory structural analysis on a single undifferentiated sample of 770 of the subjects who completed the measure 6 months after the initial administration. This analysis confirmed the 10 first order factors and also identified two second order factors based on correlations among the first order factors. In this analysis, one of the second-order factors consisted of Consciousness Raising, Dramatic Relief, Environmental Reevaluation, Social Liberation, and Self-Reevaluation. The authors labeled this factor Experiential to differentiate it from the other second-order factor which they labeled Behavioral. This factor consisted of the remaining five process factors: Helping Relationship, Stimulus Control, Counter Conditioning, Reinforcement Management, and Self Liberation. As the authors acknowledge, the experiential/behavioral distinction between the two second-order factors is difficult to maintain, and in fact, this distinction is not pursued in later published research.

Nonetheless, the 10 processes are not entirely independent, indicating that subjects are likely to use more than one process at the same time.

CHARACTERISTICS OF INDIVIDUALS AT DIFFERENT STAGES

The smoking research of Prochaska, DiClemente and colleagues suggests that individuals at different stages of change can be differentiated in other important ways as well. In a cross sectional study of 872 subjects not in treatment, Prochaska & DiClemente (1983) found that subjects at different stages of change differed in predicted ways as to their utilization of processes of change. In this study, the authors used an early version of the algorithm to divide subjects according to stage: 1) Maintenance - subjects who stated that they had quit at least six months ago; 2) Action - subjects who stated that they had quit less than six months ago ; 3) Contemplation - subjects who were seriously thinking of quitting in the next year; 4) Precontemplation - subjects who stated no intention of quitting in the near future; 5) relapse - subjects who reported having failed an attempt to quit smoking in the past year. Using the 40-item processes of change questionnaire, the authors found that the Precontemplators reported using eight of the ten processes significantly less than any other group. Contemplators used Consciousness Raising more than any other group besides Relapsers. The more behavioral techniques of Stimulus Control, Counterconditioning, and Reinforcement Management were utilized most by those in the Action and Maintenance stages. Those in the Action stage were characterized by the greatest use of Self-Liberation and the least use of Social Liberation - an unexpected finding. Self Reevaluation was utilized most by those in the Action and Contemplation stages.

In a later study, DiClemente, Prochaska, Fairhurst, Velicer, Velasquez, & Rossi (1991) focusing exclusively on the first three stages of change among smokers, an even

clearer pattern emerged of the distinctions among stages. In this study, the authors made use of a slightly updated algorithm. In addition to Precontemplation and Contemplation, the authors added the Preparation stage which included those subjects who were planning to quit within the next 30 days and had made at least one 24-hour quit attempt within the past year. Subjects consisted of a sample of over 1400 smokers who volunteered for a research project on minimal interventions. Subjects in different stages of change did not differ on important measures of smoking history including age of initiation, total years of smoking, suggesting that individuals do not inevitably arrive at a particular stage as a result of a particular type of smoking history. Consistent with the findings of the previous study, Precontemplators scored significantly lower than Contemplators on the use of nine of the ten processes on the 40-item processes of change questionnaire. Contemplators, in turn, scored significantly lower than Prepared subjects on all but two processes - helping relationships and social liberation. The only process on which there were no significant differences among stages was social liberation.

Significant differences did emerge across groups on variables measuring current smoking patterns and history of quit attempts, suggesting that those in the Preparation stage were actively attempting to modify their smoking behavior. Prepared subjects scored significantly lower than other groups on all measures of current smoking. At the same time, they reported a greater number of prior quit attempts, more quit attempts in the past year, and a higher frequency of quit attempts over time. On most of these measures, Contemplators did not differ significantly from Precontemplators, though Contemplators did report a greater number of lifetime quit attempts.

The validity of the stages was further supported by significant and interpretable differences among the stages on two measures related to self efficacy and a decisional balance scale. Precontemplators reported the greatest temptation to smoke in a variety of situations and the least confidence in their ability to abstain from smoking. On the decisional balance scale, they rated the positive aspects of smoking the highest and evidenced the least concern about the negative aspects of smoking. The opposite pattern emerged for the Prepared subjects who evidenced the least temptation to smoke, the greatest confidence in their ability to abstain, and the least favorable views of smoking on both subscales of the decisional balance measure. As predicted, the Contemplators scores on all of these measures fell between those of the Prepared subjects and those of the Precontemplators.

Initial stage assignment also predicted status in treatment at one month and six-month follow up. The treatment intervention for which subjects volunteered involved reading a particular type of self-help manual. At one month follow-up, stage of change groups differed significantly from each other on reported use of the manual with Prepared subjects reporting the greatest use and Precontemplators reporting the least. A greater proportion of Prepared subjects (56%) also reported making a 24 hour quit attempt in the intervening month than either Contemplators (24%) or Precontemplators (8%) who also differed significantly from each other. The groups also differed significantly in the proportions of subjects reporting that they were currently not smoking. More Prepared smokers reported current abstinence at one-month than those in either of the earlier stages. With the exception of reported use of the self-help manuals, all of these relationships held up after six months as well. Not surprisingly, the results suggest that minimal interventions are likely to have little effect on those in the early stages of change. However, for these individuals, it may be possible to design

interventions aimed not at immediate behavior change, but instead at the intermediate goal of movement into the next stage of change.

CORRELATES OF THE CONTINUOUS STAGE MEASURE

The continuous measure does not place people in mutually exclusive categories as the algorithm does, so research utilizing this measure is not directly comparable to that utilizing the algorithm. Interestingly, the authors of this research have not published a study which compares the continuous measure with the algorithm, so there is some possibility that two measures are not assessing the same phenomena. Nonetheless, both correlational and cluster analysis studies using the continuous measure have produced results largely consistent with those of the studies utilizing the algorithm. The results of these continuous measure studies are summarized below categorized according to the type of subjects used in the study.

Psychotherapy Patients

McConnaughy, et al., (1983) performed cluster analyses on the continuous measure scores of 155 psychotherapy outpatients to determine whether meaningful profiles of scores could be identified. These procedures yielded the most interpretable solution for eighteen clusters, although nine clusters accounted for 140 of the 155 subjects. About half of these are readily interpretable. The authors identified as "decision making" a cluster with above average scores on Contemplation and Action and below average scores on Precontemplation and Maintenance. The profile with the highest elevation on Maintenance, they label a "maintenance" cluster. Their "participation" cluster had above average scores on all scales except Precontemplation. The authors applied the label "pre-participation" to a rather ambiguous cluster which

was very similar to the "participation" cluster except with a slightly higher elevation on Precontemplation and slightly lower elevations on Contemplation, Action, and Maintenance. They arrived at three clusters which seemed to represent those in the Precontemplation stage; one of these, the authors labeled "immotive" and another they labeled "reluctant," and the third, they labeled "uninvolved." The uninvolved cluster featured below average scores on all scales. The "immotive" cluster had the highest elevation on the Precontemplation scale, though it also had a slightly above average elevation on Maintenance. The reluctant profile also had its highest elevation on Precontemplation, but in addition, it had an especially low score on Action. While the authors interpretations of most of the clusters are convincing, they acknowledge the difficulty of interpreting clusters with high or low scores on three or more stages. Moreover, the clinical relevance of these clusters remains to be determined, since the authors did not attempt to relate the scores to any measures of progress in treatment.

McConnaughy, DiClemente, Prochaska, & Velicer (1989) followed up the previous study on a larger sample of psychotherapy outpatients entering treatment. Cluster analysis of the data from 327 subjects yielded a more manageable number of clusters than the previous study - eight in all, seven of which were similar to clusters produced in the earlier study. A small and not-easily interpretable cluster labeled "non-reflective action" from the first study was not replicated in the second study nor was the "pre-participation" cluster. In addition, a new cluster emerged with an above average elevation on Contemplation and was labeled "contemplation." Thus, most of the original clusters were replicated, providing evidence that the measure can reliably distinguish groups of people on the basis of profile differences. However, like the previous study, this study provided no external validation so it is difficult to be certain of the clinical significance of the various profiles. It is also difficult to determine

precisely how the clusters are related to the stages of change as determined by algorithm. Do the clusters reflect subtler variations within stages or are they unrelated? The question raises the issue of whether individuals in the process of change actually pass through identifiable "stages" or whether the authors have identified four dimensions of individuals' attitudes about change.

Weight Control

Prochaska, Norcross, Fowler, Follick, & Abrams (1992) gathered additional evidence to validate the continuous stage measure on a sample of 184 hospital staff members involved in an on-site, behaviorally oriented weight control program. In this study, the stage and process measures proved to be powerful predictors of treatment retention and weight loss. At the outset, subjects were assessed on demographic variables, social support, and weight history, including goals, expectations, and reasons for losing weight. They were assessed on stages and processes of change and self-efficacy at the beginning, middle, and end of the 10-week program for weight control. Unfortunately, the study was plagued by attrition. Only 30 subjects completed the program and the number of subjects in the various analyses varied from 154 to 38. The authors did not have enough subjects to perform cluster analyses; however, scores on the stages of change measure were related to number of weeks in treatment and to the percentage of weight lost in the course of treatment. Specifically, in step-wise multiple regressions, scores on the Action stage at pre-treatment accounted for 2% of the variance in number of treatment sessions attended, while pre-treatment scores on Action, Maintenance, and Precontemplation accounted for 6% of the variance in percentage of weight lost. At the five week mark, the predictive power of stages increased dramatically. Action scale scores at mid-treatment predicted 11% of the

variance in number of sessions attended and 18% of the variance in percentage of weight loss. In fact, mid-treatment Action scale scores were second only to mid-treatment process of change scores in predicting weight-loss and retention in treatment. It is perhaps not surprising that pre-treatment scores had little predictive power. Most subjects applying for such a program would presumably be in the Preparation stage. To the extent that they were utilizing processes of change, these would be unrelated to treatment, and most likely ineffective, or the subjects would not be applying for treatment

In the weight-control study, mid-treatment stage scores on the Action scale predicted outcome better than demographic variables, weight history, self-efficacy, social support, and treatment goals and expectations. Those subjects who remained in treatment longest and lost the most weight were those who were in the Action stage at mid-treatment and reported actively utilizing several of the processes of change associated with the Action stage (especially Counterconditioning and Stimulus Control) while making less use of one of the processes associated with the earlier stages of change (Consciousness Raising). With the exception of Action, however, the other stage subscales did not fare so well. At mid-treatment, they accounted for no significant portion of the variance in either outcome measure. It is difficult to say what to make of this finding, particularly in light of the limited size of the sample of subjects remaining in treatment.

Alcohol Dependence

In a study of 224 adults applying for outpatient alcoholism treatment, DiClemente & Hughes (1990) demonstrated that cluster analyses of the continuous measure of stages of change could accurately distinguish groups of individuals at

different stages of change. Analysis of the data yielded five confirmed clusters. The authors determined that two of the clusters reflected two of the algorithm categories. They identified a Precontemplation cluster which included individuals whose highest score was on the Precontemplation subscale and a Contemplation cluster which included individuals with the highest scores on the Contemplation subscale. They also identified an "ambivalent" cluster characterized by above-average scores on all four subscales, an "uninvolved" cluster characterized by below average scores on all subscales, and a "participation" cluster characterized by above average scores on Contemplation, Action, and Maintenance with below average scores on Precontemplation.

Several significant differences between clusters emerged to lend a degree of convergent validity to the hypothesized distinctions among the clusters. In particular, the Precontemplation group was distinguished from the Contemplation and Participation groups in several ways. Those in the latter groups evidenced significantly "higher levels of anxiety related to their drinking behavior" and "higher levels of problems resulting from their alcohol use" than those in the Precontemplation group (p. 227). The Precontemplators evidenced a lack of concern about the possibility of any significant drinking problem, despite the fact that they did not differ significantly from the other groups on reported daily quantity of alcohol consumed or on symptoms of withdrawal. On measures of self-efficacy in the face of temptation to drink, Precontemplators scored the lowest on measures of their self-reported levels of temptation to drink in a variety of situations. They were the only group who rated their temptation to drink lower than their confidence in their ability to abstain from drinking in a these situations. They differed significantly from the Uninvolved group in both of these respects. The Uninvolved group evidenced a degree of apparent hopelessness in

the face of their drinking problems scoring the highest on the measure of temptation and the lowest on the self-efficacy measure.

In sum, the Precontemplators were most apt to deny the seriousness of their problems. Contemplators were similar to Participators in their scores on measures of concern about their drinking and in their assessments of their confidence to abstain in the face of temptation. They differed only in that Participators reported having made significantly more prior attempts to seek help. Those in the Uninvolved group seemed to have some awareness of the significance of their problems; however, they evidenced little confidence in their ability to change. The Ambivalent group is more difficult to characterize. They acknowledged the greatest degree of mental benefit and self-enhancement from drinking; they acknowledged high levels of temptation to drink but also the highest levels of confidence in their ability to abstain from drinking. Among the limitations of the study, the authors note that "relationship of the groups to treatment process and outcome is not established" (p. 233).

SUMMARY OF EMPIRICAL DATA

Sound evidence exists to support the construct and predictive validity of the stages of change as assessed by the algorithm; there do seem to be clear and clinically meaningful differences between those categorized into different stages of change on the basis of this measure. However in published research, this measure has only been used with smokers, so the generalizability of the findings to other populations with different types of problems remains to be established. The continuous stage measure has been tested in several different populations and has evidenced a relatively consistent factor structure. However, its construct and predictive validity remain to be clearly established and confirmatory procedures have yet to verify its factor structure. It is also not clear

whether scores on these measures have clinical significance. The Action subscale of the continuous stage measure did predict outcome in the weight control study cited previously (Prochaska, Norcross, Fowler, Follick, & Abrams 1992) suggesting that a behavioral intervention will have the greatest success with those individuals who can be moved into the Action stage by mid-treatment. Cluster analyses have produced interpretable cluster profiles in several studies, and in the alcohol study cited above (DiClemente & Hughes, 1990), interpretable differences in scores on several measures emerged among at least three of the cluster profiles. It remains to be determined whether results like these can be generalized to other types of addicts and to methadone maintenance patients in particular. No study employing cluster analysis has produced profiles which correspond one-to-one with algorithm stages, and no study has directly compared the algorithm with the continuous stage measure. In the absence of such a comparison, it is not clear to what extent the two methods actually measure the same phenomena.

OVERVIEW OF EXPERIMENTAL DESIGN AND METHODS

The present investigation was designed to address some of the remaining questions regarding the validity and generalizability of the stage model while using the model to illuminate poorly understood aspects of methadone maintenance treatment. The investigation was conceived as three separate studies distinguished from each other by different data collection procedures.

Study 1 involves collection of questionnaire data from subjects at four methadone maintenance clinics, providing a large enough sample to assess the psychometric properties of the measures. It utilizes confirmatory factor analytic procedures to assess the factor structure of modified versions of the continuous stage

and process measures and to construct scales for use in subsequent analyses. This study assesses whether the same processes and stages which have been identified in smokers, psychotherapy patients, weight control patients, and alcoholics can also be identified in methadone patients. It also directly compares the continuous and algorithm stage measures in order to determine the convergence between these two methods of assessing stage. This study also provides a measure of the external validity of the stage and process measures by assessing the relationship between scores on confirmed subscales and self reported drug use over a 30-day pretest period.

Examination of the relationships among confirmed measures, demographic data, and self-reported drug use provides answers to some of the following questions. Do patients in different stages of change differ in terms of their demographic characteristics? Do patients in the first three stages differ in the amount of drug use they report in the past 30 days? Which processes of change are most utilized by those in each of the five stages of change? Is the use of particular processes of change associated with less self-reported drug use?

In addition to the stage and process measures, the study also utilizes a measure of strategies for coping with stress. Coping measures and the concept of coping have a more well established research history than the "transtheoretical" model. The coping measure utilized in this investigation provides a standard against which to compare the psychometric properties and predictive efficacy of the stage and process measures while providing additional information about the characteristics of individuals in different stages of change.

Study 2 features a longitudinal design and involves only a sub-sample of the subjects who participated in Study 1, namely those patients who attended the one clinic

where urinalysis data were readily available. To determine whether the constructs are related to progress toward abstinence, stage, process, and coping measures are used to predict treatment progress as measured by urinalysis results over a three-month posttest period. This study also affords an opportunity to assess the reliability of subjects' self report since self-reported drug use could be checked against clinic records of urinalysis results over the six-month pretest period.

In Study 3, more detailed and qualitative data are collected from a subset of the Study 2 subjects. Since these subjects are drawn from the clinic where the investigator also serves as clinical director, Study 2 provides an opportunity to bring together empirical data with knowledge of the subjects gained in a clinical setting. These data are examined to provide a better understanding of the clinical significance of the stage and process constructs as well as their strengths and shortcomings.

STUDY 1: VALIDATION OF THE MEASURES

METHOD

SUBJECTS

The sample consisted of 289 subjects recruited from four Philadelphia-area methadone maintenance clinics. Subjects were recruited by means of bulletins posted in the clinics during medicating hours. This is the time when the largest number of patients were available, and recruitment at this time assured that a representative sample of clinic patients had the opportunity to participate. All subjects were opiate-addicted methadone maintenance patients engaged in treatment at the time of their participation in the study. No minimum amount of time in treatment was specified and subjects reported treatment tenures ranging from two days to twenty-three years. Subjects were excluded from participation only if they were unable to read and comprehend the research forms or if they evidenced impairments (e.g. psychosis or intoxication) which would have interfered with their ability to provide informed consent, understand the questionnaires, or to provide accurate information.

Data from 13 subjects were judged to be invalid and therefore omitted. Subject data were ruled invalid if: 1) the subject appeared to have answered randomly or in a clear pattern for more than two pages (e.g. all twos or alternating ones and threes); or 2) the subject did not follow instructions in filling out the demographic data sheet (e.g. answering "yes" and "no" to questions which asked for numbers or dates). Nine subjects met the first criterion and three subjects met the second. The thirteenth subject's data was discarded because his case defied stage categorization. Although this subject acknowledged chronic use of drugs generally considered illicit, he stated that the

program approved his drug use because of his illness. During the administration of the questionnaire, he revealed to the author that he had AIDS. He stated that he had used Percocet every day for the past 30 days but that this use was approved because he had kidney stones. He was also taking benzodiazepines every day and smoking marijuana regularly, all he stated, with the approval of the program.

The sample included subjects with a wide range of backgrounds. (The complete demographic characteristics of the sample are listed in Appendix A.) Forty-four percent of the subjects were female; 53% were white with 36% black and 9% Hispanic. Subjects ranged in age from 20 to 63 years with an average age of 39 years. The subjects reported an average educational level of over 11 years, with 60% reporting that they had graduated high school or received a G.E.D. Nineteen percent of the subjects reported full-time employment while 32% reported that they were unemployed and 20% indicated that they were receiving disability payments. Very few subjects (less than 3%) reported that their treatment was court-mandated. The subjects reported substantial drug histories, averaging 17 years of drug use 14 years of opiate use prior to their current treatment episode. This means that on average, these subjects had spent over 47% of their lives using illicit drugs prior to their current treatment episode. There was great variability in the amount of time they reported being in treatment at their current clinic but the average was 3.8 years.

To determine the extent to which the clinic samples represented the populations in treatment at each of the four clinics, demographic data were obtained on the total populations of methadone maintenance patients at each location. Since complete demographic data were not available from each clinic, it was not possible to make exhaustive comparisons. Nonetheless, the available data were analyzed to determine

whether the sample characteristics differed significantly from the characteristics of each clinic population. The details of these analyses are provided in Appendix B.

The analyses indicated that the samples differed from the clinic populations only in the area of employment status. In general the samples contained greater proportions of disabled patients as well as a smaller proportions of full-time employed patients than the clinics from which they came. This discrepancy created some cause for concern about the generalizability of the findings, since full-time employment is generally associated with more favorable outcome among heroin addicts (Rounsaville, Tierney, Crits-Christoph, Weissman, & Kleber, 1982). On the basis of this finding, it was possible to infer that the sample represented more poorly functioning patients with a poorer prognosis than the general populations at the various clinics. This conclusion was contradicted, however, by the fact that the samples did not differ from the clinic populations in the proportions of patients receiving take-home bottles of medication. Subjects were asked about the number of take-home bottles they received per week in order to provide a rough measure of treatment progress and stability. Take-home bottles of methadone allow patients to reduce the number of times per week they must visit the clinic to receive medication. Federal regulations specify that take-homes can only be granted to patients who are not currently using illicit drugs and who have been in treatment for specified periods of time. Other than in the area of employment, there was no evidence that the samples did not represent the populations of methadone maintenance patients at the four clinics.

MEASURES

General Issues

Measures of stages and processes of "change" presuppose a problem or behavior which is being changed. The Stages of Change Algorithm, in particular, necessitates the specification of a problem since stages are defined by the amount of time since the subject has engaged in a specific behavior or plans to stop the behavior (e.g. smoking cigarettes, drinking, using cocaine, etc.). In published studies, the process measures too have referenced specific behaviors. If one does not specify a problem, it is not clear what sort of change one is measuring. For the measures in this study, the problem specified on the questionnaires was use of illicit drugs (i.e. mood altering drugs which have not been legitimately prescribed by a physician, excluding caffeine, alcohol, and tobacco.). This problem is specific enough to be operationally definable; at the same time it has broader clinical relevance than use of a single specific drug (e.g. heroin), since many methadone patients use a variety of drugs. This is also the general focus of treatment in most methadone maintenance clinics and specified by FDA regulations which make no distinctions among different types of illicit drug use in determining program privileges. Thus most programs uniformly penalize the use of any illicit substances by restricting take-home medication privileges. In many clinics, chronic illicit drug use (regardless of substance) may result in administrative detoxification and discharge from the program.

Drug History & Stages of Change Algorithm

All subjects were classified into stages using data from the Drug History questionnaire (Appendix C) and the Stages of Change Algorithm (Appendix D). The

algorithm is similar to those used by Prochaska and colleagues in the studies described previously. Those subjects were classified as Precontemplators who acknowledged some kind of drug use in the previous 30 days and who answered "no" to the question "Do you plan to quit using all illicit drugs in the next 6 months?" Subjects were classified as Contemplators if they answered "yes" to the previous question but answered no to the question, "Do you plan to quit using all illicit drugs in the next 30 days?" Subjects were classified into the Preparation stage if they acknowledged using drugs in the past 30 days but stated that they planned to quit all illicit drug use in the next 30 days. Subjects who indicated that they had not used any illicit drugs for the past 30 days but who acknowledged use in the six-month period preceding the administration of the questionnaire were classified in the Action stage. Subjects were placed in the Maintenance stage if they indicated that they had not used illicit drugs in the past 6 months.

Change Assessment Scale - URICA

This is a 34 item measure based on the University of Rhode Island Change Assessment Scale (URICA) (McConnaughy, et al., 1983) used by Prochaska and colleagues in much of their research. The URICA consists of 32 items which make up four subscales corresponding to four of the hypothesized stages of change: Precontemplation, Contemplation, Action, and Maintenance. There is no Preparation subscale because this scale failed to be confirmed by factor analysis (Prochaska, et al., 1992). Presumably subjects in this stage would be expected to obtain their two highest scores on the Contemplation and Action subscales. The measure used in this study included the 32 items from the URICA plus an additional two items generated by the author and specifically geared to assess the Precontemplation stage in the population of

methadone maintenance patients. These items were added because the Precontemplation subscale failed to be confirmed as a factor in a study of cocaine users (Rosenbloom, 1991). Rosenbloom suggested that the usefulness of the scale might be improved by the addition of items tailored to the specific characteristics of the population under investigation.

Each item consists of a statement regarding a "problem" along with a five point Likert scale on which subjects are asked to rate the extent to which they agree or disagree with the statement. This particular version of the measure defines the problem as illicit drug use. (See Appendix E for a copy of the measure and Appendix L for a breakdown of the items by subscale.).

Processes of Change Scale

This 60 item questionnaire is based on similar measures designed for use in other areas of addiction research including smoking, (Prochaska, Velicer, DiClemente, & Fava, 1988), weight control (Prochaska, Norcross, Fowler, Follick, & Abrams, 1992), and cocaine use (Rosenbloom, 1991). For this version, items from related versions were modified and supplemented with several new items generated by the author for use regarding the problem of illicit drug use in a population of methadone maintenance patients. The measure includes five items for each of twelve hypothesized subscales. These subscales represent the ten processes reflected in the original measure (Prochaska, et al., 1988) plus subscales representing two additional processes (Interpersonal Control and Medication) suggested by later research (Prochaska, Norcross, Fowler, Follick, & Abrams, 1992). Each item describes a strategy or situation which an individual might make use of in the process of discontinuing illicit drug use. For each item, subjects are asked to rate on a 5 point Likert scale how often

they make use of the particular situation or thought to help them avoid using illicit drugs. (See Appendix F for a copy of the measure and Appendix N for a breakdown of items by subscale.)

Coping Strategies - COPE

Subjects also completed a measure which was designed to assess dispositional coping styles. The distinction between "coping" and processes of change is not always clear. Indeed, Prochaska and colleagues have used the Processes of Change questionnaire to assess how people "cope" with the problem of psychological distress (Norcross, Prochaska, & DiClemente, 1986). However, the concept of coping derives from a somewhat different conceptual framework than the "transtheoretical" model. Whereas the stages and processes provide a means for understanding an individual's efforts to discontinue a problem behavior such as drug use, the concept of coping abilities is more often used to explain why problem behaviors persist. Addicts continue to use drugs because of deficits in their ability to cope with life's stresses. From this perspective, the drug use itself constitutes a means of coping. The two perspectives do not necessarily conflict; rather the concept of coping provides a slightly different focus, addressing how individuals maintain homeostasis in the face of stress rather than changing problem behavior. The scale was included in the investigation to provide a more traditional self-report measure of behavior against which to compare the predictive power of the stage and process measures.

In this study, subjects completed Carver, Scheier, and Weintraub's (1989) COPE measure. This measure was designed to assess 14 theoretically distinct coping strategies. Five of the scales were designed to measure aspects of problem-focused coping. These include Active Coping, Planing, Suppression of Competing Activities,

Restraint Coping, and Seeking Social Support for Instrumental Reasons. Suppression of Competing Activities involves putting other issues aside in order to focus on the immediate stressor. Restraint Coping refers to preventing oneself from acting impulsively in response to stress. These problem-focused strategies come into play when an individual acts to change a stressful circumstance to make it less stressful. Five scales measure aspects of emotion-focused coping. These scales include Seeking Social Support for Emotional Reasons, Positive Reinterpretation, Acceptance, Denial, and Turning to Religion. Positive Reinterpretation involves reframing a stressful experience as an opportunity for growth. Acceptance means learning to live with a stressor rather than taking any action to change it. Denial as assessed by this measure refers to a strategy of "refusal to believe that the stressor exists or trying to act as though the stressor is not real" (Carver et al., 1989, p. 270). These kinds of strategies involve changing one's emotional response to a stressful circumstance and, according to the authors of the measure, they can be adaptive in the face of stressful circumstances which cannot be changed. The remaining four scales measure aspects of coping which Carver, et al. describe as less useful. These are Focusing on and Venting Emotions, Behavioral Disengagement, Mental Disengagement, and Alcohol or Drug Use. Behavioral Disengagement refers to consciously deciding to give up on solving the problem which is creating stress. Mental Disengagement involves mentally retreating from a stressor by either sleeping, daydreaming, or distracting oneself.

The COPE scale consists of 56 items - four items for each of the fourteen scales. Each item describes one strategy an individual might employ to cope with stress. For each item, subjects are asked to rate on a four point Likert scale the extent to which they usually respond to stress in this way. (See Appendix G for a copy of the measure and Appendix P for a breakdown of items by subscale.)

Demographic Questionnaire

Demographic data including age, gender, ethnic background, level of education, employment status and amount of time spent in treatment were collected by means of another questionnaire (Appendix H). No specific differences among stage and process measure scores were predicted on the basis of demographic differences; however it was important to explore for such differences. The questionnaire was also included in order to determine the characteristics of the sample and the extent to which it was representative of the general population of methadone maintenance patients at the selected clinics.

PROCEDURE

The procedures at Clinic 1 differed slightly from the procedures at the other three clinics and are outlined in more detail below (see Study 2). At the other three clinics, the measures were administered on a single day to groups of approximately 15 subjects at a time. To facilitate honest responding, subjects at these clinics were assured that the questionnaires were completely anonymous with no means provided for identifying subjects from their completed measures. At Clinic 1, where follow-up data were also collected, subjects were assured that their responses would be kept confidential from clinical staff and would not affect their treatment. All subjects completed informed consent forms (see Appendices I & J). To insure against order effects, the administration order of the stage, process, and coping measures was randomized across subjects. The Drug History questionnaire was always administered before these other measures to insure that subjects' reports of their recent drug use were not influenced by any response set which the measures may have induced. All questionnaires were completed on site and in the presence of the author or research assistants to insure

against incomplete or random responding. The average time required to complete the questionnaires was approximately 45 minutes. Subjects were paid $10.00 for their participation.

RESULTS

SUMMARY OF STUDY 1 FINDINGS

The algorithm measure provided a means for dividing subjects into the five stage categories, each of which was well represented in the sample. Analyses of the demographics and drug use histories associated with each of the stages of change revealed few differences across stages. However, subjects in the Precontemplation stage reported the longest treatment histories at their current clinics, reporting significantly longer treatment tenures than subjects in any other stage besides Maintenance.

Confirmatory factor analytic procedures failed initially to confirm the hypothesized factor structures of either the continuous stage measure (URICA) or the Processes of Change Scale with this population. Respecification of the model provided support for the validity of three of the four hypothesized URICA scales; however, the Maintenance scale failed to be confirmed. Direct comparison of the two stage measures (algorithm vs. URICA) indicated little convergence between them, although the groups of subjects within algorithm stage categories produced average profiles of URICA scores which were largely consistent with the predictions of the Prochaska et al. model. The groups of subjects comprising the Precontemplation, Contemplation, and Action algorithm stages each obtained their highest average URICA scores on the scale corresponding to their stage classification (e.g. algorithm Precontemplators obtained

their highest URICA scores on the Precontemplation scale). Both the Action and Maintenance scale evidenced relationships with recent drug use, though contrary to the model's predictions, the Maintenance scale correlated positively with recent drug use after controlling for scores on the Action scale.

Respecification of the Processes of Change scale resulted in a measure with four scales instead of the hypothesized twelve. For the most part these scales resulted from the consolidation of related factors from among the original twelve. Subjects failed to discriminate among the four processes associated with the earliest stages of change. Items from these scales were combined to form a single scale termed Reevaluation. Items from the Self Liberation scale were retained without additions from other hypothesized factors. Items from the Helping Relationships and Reinforcement Management scales were combined to form a scale termed Reinforcing Relationships. Items from the remaining three behavioral process factors were combined to form a single Behavioral Processes scale. Groups of subjects within different stage classifications produced profiles of process scale scores which were consistent with the predictions of the model. Subjects in the later stages reported making greater use of the latter three processes than did subjects in the earlier stages. These three process scales (Self Liberation, Reinforcing Relationships, and Behavioral Processes) all correlated negatively with reported recent drug use. Subjects did not differ across stage categories in the extent to which they reported making use of Reevaluation. However, after controlling for Behavioral Processes scores, the Reevaluation scale evidenced a positive correlation with recent reported drug use.

The fourteen hypothesized scales of the COPE measure also failed to be validated by confirmatory factor analytic procedures. These procedures did support a

respecified model which contained, in unaltered form, nine of the original fourteen scales. The pattern of average COPE scale scores across stages indicated that subjects in the later stages (especially the Maintenance stage) reported more use of adaptive coping strategies and less use of maladaptive strategies than subjects in the earlier stages. Subjects in the Precontemplation stage were characterized by high scores on the Alcohol/Drug Use scale which assesses drug and alcohol use as a means of coping. Several of the COPE scales were associated with reported recent drug use. In particular, the Alcohol/Drug Use scale evidenced a stronger correlation with reported recent drug use than any other scale on any of the measures.

STAGES OF CHANGE ALGORITHM

Subjects were classified into stages of change on the basis of an algorithm similar to the ones used in previous research by Prochaska, DiClemente and colleagues. The self-report data from the Drug Use History questionnaire (Appendix C) were used to determine whether subjects had used illicit drugs in the past 30 days or in the past six months. Since only the month and year of last use of any substance were recorded, drug use in the past six months was determined to mean any use in the past six calendar months including the month in which the questionnaire was completed. Thirteen of the 276 subjects could not be classified into a stage on the basis of the algorithm because of missing or inconsistent information. Five of these subjects failed to provide a date for their last opiate use and denied use of other drugs. Five subjects indicated that they were currently using marijuana/hashish but on the Stage Algorithm indicated that they had not used any illicit drugs in the past 30 days. Three subjects acknowledged use of other drugs including opiates in the last 30 days on the Drug Use History questionnaire but then indicated that they had not used any illicit drugs in the past 30 days on the Stage

Algorithm. The results for the remaining 263 subjects are summarized in Figure 2.1. The Prepared subjects made up the largest category (29.7%) but all stages were well represented in the sample.

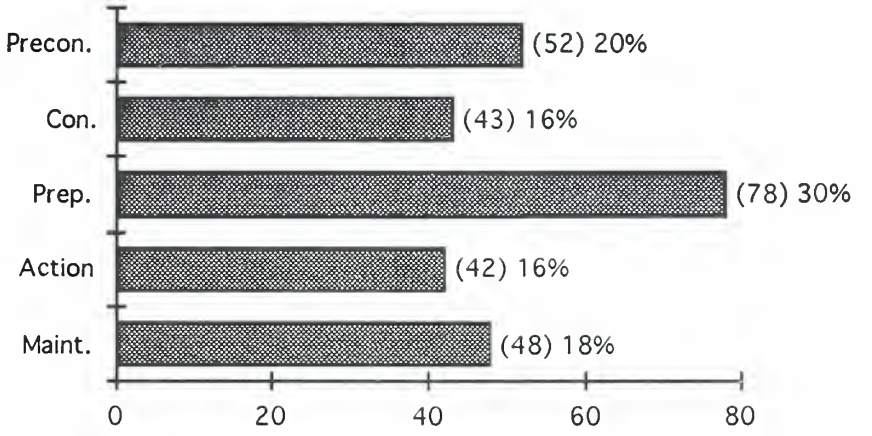

Figure 2.1 . Percentage (and number) of subjects in each of the five stages of change (N = 263).

Drug Use

Subjects were asked to report how many days in the past 30 they had used various classes of illicit substances (see Appendix C). Over 65% of subjects acknowledged illicit drug use in the 30-day pretest period and were consequently classified into one of the first three stages of change. The percentages of subjects reporting various types of drug use within each stage are listed in Table 2.1 along with the numbers of missing cases for each category. (For all subsequent analyses, missing data were interpreted to mean no drug use for the particular category.) These percentages did not vary greatly across stages. Opiates were the most widely used drugs followed by cocaine and benzodiazepines.

Table 2.1
Number of (and percentage) of subjects within each stage category acknowledging use of various types of drugs within the past 30 days.

Drug Category	Precontem-plation (n = 52)	Contemplation (n =43)	Preparation (n = 78)	Missing Cases
opiates	42 (81%)	31 (72%)	48 (83%)	0
cocaine	23 (44%)	22 (51%)	48 (62%)	0
benzodiazepines (non-approved)	24 (46%)	22 (51%)	32 (41%)	1
marijuana/hashish	17 (33%)	11 (26%)	17 (22%)	2
other drugs	10 (19%)	2 (5%)	7 (9%)	9

To create an indicator which included a measure of polydrug use, the sum of the days of reported use for any drug was calculated for each subject. Thus, a subject reporting 17 days of opiate use and 20 days of cocaine use in the past 30 would obtain a score of 37 on the combined drug use variable. To determine whether there were differences across stages in the amount of acknowledged drug use, a series of ANOVAs were performed using the number of days of use for the various classes of drugs as the dependent variables. These results are summarized in Table 2.2. They indicate that there were no differences across stages in the use of any single class of drugs except the "other" category. Subjects in the Precontemplation stage acknowledged more use of these drugs (mostly propoxyphene and barbiturates) than subjects in the other stages. In addition, subjects in the Precontemplation stage reported more total drug use than subjects in the Preparation stage. However, subjects in all three stages acknowledged considerable recent drug use. The average subject acknowledged use of two classes of drugs including about ten days of opiate use.

Table 2.2

Reported drug use for subjects in each of the first three stages of change: days of reported use of each of the five classes of drugs; combined drug use; and average number of drugs used.

Type of drug used	Precontem-plation	Contem-plation	Action	F-test	Tukey Comparisons
	M (SD) n = 52	M (SD) n = 43	M (SD) n = 78	F Signif.	
opiates	11.75 (11.01)	9.70 (11.29)	9.65 (11.06)	.64 n.s.	-
cocaine	4.67 (8.76)	4.67 (7.24)	5.72 (9.05)	.32 n.s.	-
benzodiazepines (non-approved)	8.58 (12.29)	6.53 (9.69)	4.65 (8.81)	2.33 n.s.	-
marijuana/hashish	4.44 (9.28)	4.41 (9.63)	1.61 (5.22)	2.75 n.s.	-
other (propoxyphene, amphetamines, barbiturates, etc.)	3.23 (8.33)	.43 (2.38)	.64 (3.25)	4.44 $p < .05$	PC > C, PA
combined drug use (theoretical max. = 150)	32.17 (22.42)	25.49 (17.26)	22.23 (18.84)	4.03 $p < .05$	PC > PA
total no. of different types of drugs used	2.23 (1.11)	2.05 (.82)	2.17 (.89)	.46 n.s.	-

Demographic Characteristics of Subjects in Different Stages

To be certain that the algorithm stage measure was not confounded by some demographic variable and to explore any relationships between subjects' stage and demographic characteristics, it was important to screen for the possibility of associations between the algorithm stages and the demographic variables. To examine the relationship between the stages of change and the categorical demographic variables, multiple chi-square tests were conducted, using Bonferroni's adjustment, crossing stages of change with: sex; ethnic background; marital status; G.E.D. status; and employment status. The tests showed no significant relationships except between the

stages of change and employment status, χ^2 (16, 261) = 48.08, p < .001. The numbers of subjects in each of these categories are listed in Table 2.3 below.

Table 2.3
Numbers of subjects in each of five employment status categories (N = 261).

Employ-ment Status	Precon-templation	Contemplation	Preparation	Action	Maintenance
	observed value (expected value)	observed value (expected value)	observed value (expected value)	observed value (expected value)	observed value (expected value)
full-time	8 (9.8)	6 (8.1)	13 (14.5)	12 (7.9)	10 (8.8)
part-time/ occasional	8 (6.8)	4 (5.6)	10 (10.0)	1 (5.5)	11 (6.1)
unemployed	17 (17.1)	21 (14.2)	16 (25.4)	20 (13.9)	12 (15.5)
homemaker	2 (7.6)	6 (6.3)	22 (11.2)	2 (6.1)	6 (6.8)
disabled	17 (10.8)	6 (8.9)	16 (15.9)	7 (8.7)	8 (9.7)

Note. Since only 2 subjects indicated that they were full-time students, this category was dropped from the analysis.

The nature of the relationship between stage and employment status is somewhat complex. Among the full-time employed subjects, a greater-than-expected proportion fell into the Action stage with slightly fewer than expected proportions in the Precontemplation, Contemplation, and Preparation stages. This, in itself, is not surprising since one might expect the fully employed subjects to be doing better in treatment. However, some of the other relationships were not so straightforward. Among the part-time employed subjects, a greater-than-expected proportion of subjects fell into the Maintenance stage with a smaller-than-expected proportion in the Action stage. The unemployed were over-represented in the Contemplation and Action stages and under-represented in Preparation and Maintenance. The majority of homemakers fell into the Preparation stage with fewer than expected numbers in the Precontemplation and Action stages. Among disabled subjects, a greater than expected proportion fell into

the Precontemplation stage while slightly fewer than expected fell into the Contemplation, Action, and Maintenance stages.

A MANOVA was conducted to determine whether there was a significant relationship between the stages of change and the following continuous demographic variables: age; level of education; number of take-home bottles of medication; years of drug use; years of opiate use; and months in methadone treatment. Years of drug use were computed by first subtracting the self-reported age at which each subject began using drugs from their age at the time of testing and then subtracting the amount of time they reported being in treatment at their current clinic. Years of opiate use were computed in a similar fashion. Both variables provide measures of drug use history prior to each subject's current treatment episode and do not include time spent at the current clinic, since this time is included in the months-in-treatment variable.

A relationship was expected between stages and number of take-homes since take-homes are generally only made available to patients who remain abstinent from illicit drugs. Therefore, if subjects reliably reported their drug use, those in the maintenance stage should have more take-homes than subjects in other stages. A relationship between stages of change and time in treatment was also predicted since the Maintenance stage requires six months of abstinence from illicit drugs and addicts would be unlikely to achieve this outside of treatment. Moreover, if treatment is effective, one might expect that longer treatment tenures would be associated with membership in the Action and Maintenance stages, though the data indicate that this was not the case.

The MANOVA was significant, Wilks Lambda (24, 852.42) = .63; $p < .001$. A univariate F test was significant for number of take-homes as predicted (see Table

2.4). A Tukey test indicated that Maintenance subjects reported significantly more take-homes than subjects in any of the other categories. In addition, subjects in the Action stage reported significantly more take-homes than subjects in the Preparation stage. Univariate F tests were also significant for age and months in treatment. A Tukey test indicated that those in the Maintenance stage were significantly older than those in the Preparation stage. This was not surprising in that it suggests that it may take an addict longer to achieve a state of Maintenance than Preparation.

Table 2.4
Comparisons of demographic variables across algorithm stage categories.

Variable	Precontem-plation (n = 52)	Contem-plation (n = 43)	Preparation (n = 78)	Action (n = 42)	Main-tenance (n = 47)	F test	Tukey comparisons
	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	F Signif.	P < .05
Take-homes per week	.44 (1.14)	.33 (1.13)	.04 (.35)	1.07 (1.90)	2.23 (2.16)	F(4, 253) = 20.49 p < .0001	PA<A,M PC,C,PA,A< M
Drug Use Hx (yrs.)	16.70 (7.08)	19.24 (9.20)	15.88 (7.77)	18.42 (8.03)	17.49 (9.01)	F(4, 253) = 1.44 n.s.	-
Opiate Use Hx (yrs.)	14.00 (7.38)	15.90 (10.45)	11.68 (9.15)	15.05 (8.95)	14.49 (9.93)	F(4, 253) =1.84 n.s.	-
Age	39.25 (5.34)	40.16 (8.24)	37.18 (7.63)	39.57 (7.41)	41.69 (7.09)	F(4, 258) = 3.17 p < .05	PA < M
Months in Treatment	74.08 (77.32)	35.17 (52.94)	30.63 (45.90)	31.26 (43.67)	56.79 (52.08)	F(4, 253) = 6.29 p < .001	PC> PA,C,A

What was surprising was the strength and direction of the association between the stages of change and the amount of time spent in treatment by each subject at their current methadone clinic. This relationship is depicted in Figure 2.2. Precontemplators

reported an average treatment tenure of approximately six years at their current clinics - over twice as long as subjects in the Contemplation, Preparation, and Action stages and about 17 months longer than those in the Maintenance stage. On the other hand, they did not differ significantly from the other groups in terms of the amount of time they spent using drugs prior to entering treatment.

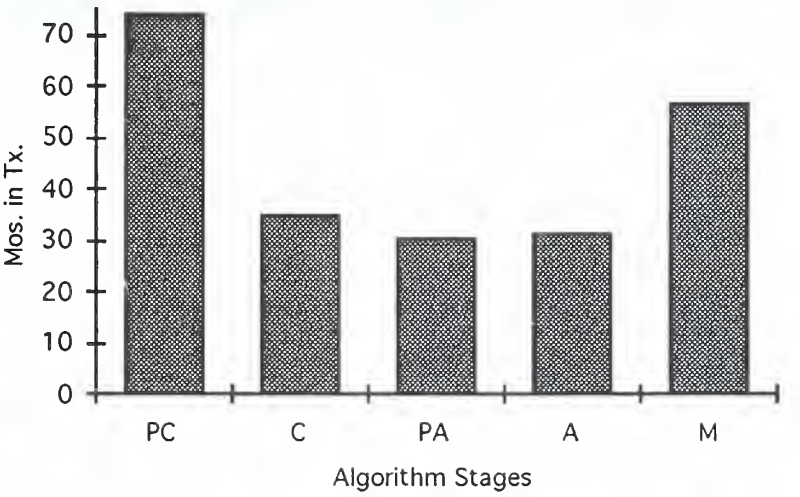

Figure 2.2. Average reported time in treatment at current clinic for subjects in each of the five stages of change.

To better understand the relationship between the stages of change and time in treatment, time in treatment was divided into four intervals with roughly comparable numbers of subjects in each. The proportions of subjects per interval in each stage are shown in Figure 2.3.

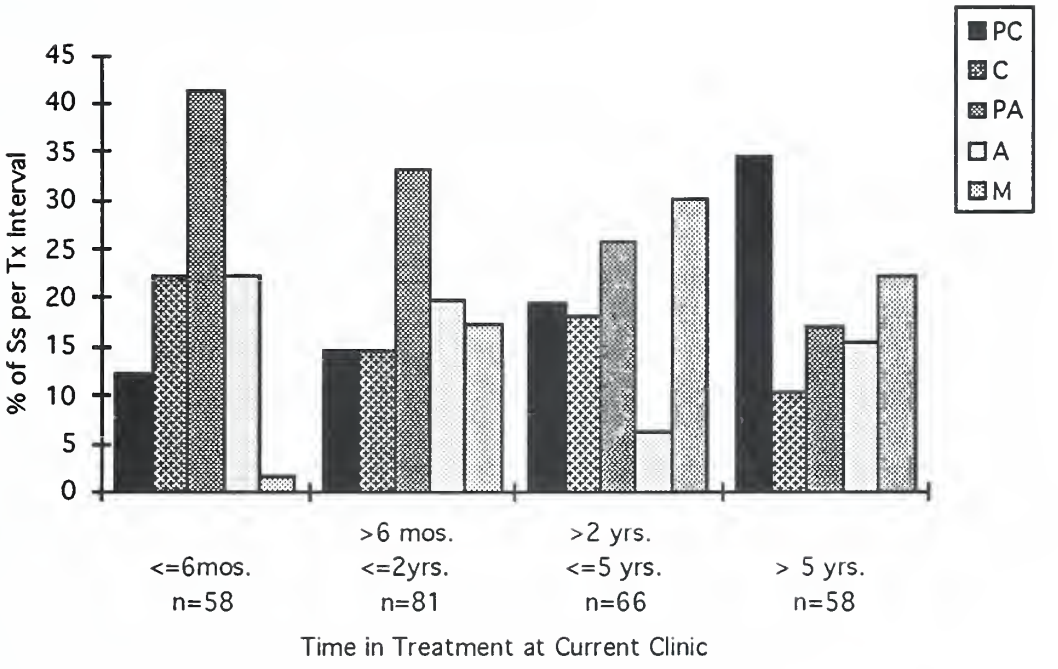

Figure 2.3. Percentage of subjects in each of the stages of change for four different treatment intervals.

As Figure 2.3 shows, the proportion of those in the Precontemplation stage increases as a function of time in treatment. Among subjects who reported five or more years in treatment at their current clinic, approximately 35% fell into the Precontemplation stage while only 12% of those who had been in treatment for six months or less were Precontemplators. The proportion of those in the Preparation stage decreases as a function of time. The greatest proportion of subjects in the Maintenance stage can be found in the interval of 2 to 5 years in treatment. The highest proportion of subjects in the Action stage can be found among those who have been in treatment for six months or less.

CHANGE ASSESSMENT SCALE - URICA

Factor Confirmation and Scale Construction

The continuous measure of stages of change (URICA, Appendix E) has demonstrated a relatively consistent factor structure in a variety of studies with different populations. These previous studies have supported the reliability and validity of the hypothesized four scales measuring Precontemplation, Contemplation, Action, and Maintenance. However, none of these studies has focused on a methadone maintenance population and none has employed confirmatory factor analytic procedures, though such procedures are better suited to verifying hypotheses than are exploratory methods. In this study, the data from the URICA were analyzed using the structural equation modeling program available in the EQS statistical software package (Bentler, 1991). Data from all 276 subjects were used in the analyses. (See Appendix K for an explanation of treatment of missing data.)

Inspection of the 34 by 34 correlation matrix revealed that one of the Action items (Item 20: "I have started working on my problems but I would like help.") correlated highly with the Contemplation items. In the view of the author, the phrasing of this item suggests a much more tentative attitude toward change than the other Action items; in addition, the second clause conveys a desire for help rather than resolve to take action. For these reasons, Item 20 was dropped from subsequent analyses.

Analysis of the remaining 33 by 33 item matrix failed to confirm the four factor model. In confirmatory factor analysis, a significant chi-square means that the null hypothesis cannot be rejected. In other words, a non-significant chi-square suggests a well-fitting model. In this case the maximum likelihood solution yielded a significant

chi-square goodness-of-fit value, χ^2 (489, N=276) = 1149.08, $p < .001$. However, for large samples, a non-significant value is very difficult to achieve and the chi-square goodness-of-fit test results in the rejection of virtually any model (Bentler & Bonett, 1980; Marsh, Balla, & McDonald, 1988). Alternate measures of goodness of fit have been proposed by Bentler & Bonett (1980) and Bentler (1988); however, in this case, these figures, too, failed to support the model: Bentler-Bonett Normed Fit Index = .62; Bentler-Bonett Nonnormed Fit Index = .71; Comparative Fit Index = .74. Bentler (1992) suggests that values below .90 on these indices indicate a poorly specified model. The values obtained for this analysis are well below .90 and indicate that the original four-factor model does not fit the data well.

Inspection of the results suggested that the model's failure was due, at least in part, to large correlations among the factors - particularly between Maintenance and Contemplation (r = .93). This result suggested that the two scales were indistinguishable in this population. At this point, the model was respecified and the data analyses departed from the realm of strictly confirmatory procedures. In practice, very few analyses are strictly confirmatory, since most models initially fail to provide acceptable fit and must be respecified (Anderson & Gerbing, 1988). In this study, continued use of structural equation modeling allowed for a theory-driven exploration of alternative hypotheses and construction of scales. Confirmatory procedures were used to build scales on the basis of theory and past research and at the same time to cull from the item pool those items which poorly represented their hypothesized scales in this population.

A second model was run specifying only three factors - Precontemplation, Action, and a third factor composed of all of the items from the Contemplation and

Maintenance scales; however this, too failed to produce acceptably high indices of goodness-of-fit. Inspection of the loadings indicated that the five items with the highest loadings on the third factor were all Contemplation items. None of the Maintenance items loaded above .60 on this factor, indicating that the Maintenance scale was poorly defined for this population. Therefore, all of the Maintenance items were dropped from subsequent analyses.

In order to produce a brief measure and to eliminate items which loaded only weakly on their hypothesized scales, another model was run, retaining only the four top loading items from the Action and Precontemplation and Contemplation scales. For this model, the maximum likelihood solution yielded a much reduced though still significant chi-square goodness-of-fit value, χ^2 (51, $\underline{N}$=276) = 111.71, $p < .001$. This model also resulted in much improved indices of goodness of fit: Bentler-Bonett Normed Fit Index = .87; Bentler-Bonett Nonnormed Fit Index = .90; Comparative Fit Index = .93. These indices approach or exceed the .90 cutoff indicating that this model fits the data adequately (See Appendix L for a complete list of the final items with their factor loadings and a path diagram of the final model).

Three URICA scale scores were calculated for each subject by taking the average of the scores obtained on the four items comprising each of the three confirmed scales. In the event of missing data on any of these items, the mean of the remaining item scores served as that subject's score. For the purposes of comparison with previous research, a Maintenance scale was constructed of the four highest loading Maintenance items from the initial confirmatory factor analysis (see Appendix L for a list of these items). Next, each subject's scale scores were converted into T-scores with a mean of 50 and a standard deviation of 10. At this point, it was discovered that one of the

subjects had distinguished herself from the others by the deviance of her responses, obtaining T-scores approximately three standard deviations away from the mean on all four of the scales (Precontemplation = 84.5, Contemplation = 9.6, Action = 10.7, and Maintenance = 10.4). No other outliers approached these scores in magnitude. Because it was determined that her data would unduly influence statistical analyses, her case was dropped from subsequent analyses.* Her case will be discussed in greater detail below since she happened to be one of the interview subjects in Study 3.

The three confirmed scales evidenced adequate internal consistency as indicated by Cronbach's alpha coefficients of around .70. The mean scores indicate that subjects tended to endorse the Precontemplation items at a low level while endorsing all other items at a relatively high level (See Table 2.5 for descriptive statistics.).

Table 2.5
Means, standard deviations, and Cronbach's alpha coefficients for each of the URICA scales prior to conversion to T-scores.

URICA Scale	M	SD	Cronbach's alpha
Precontemplation	2.04	.84	.71
Contemplation	4.05	.69	.71
Action	3.89	.68	.69
Maintenance	3.77	.70	.52

The Pearson correlations among the three confirmed scales exhibited the same pattern which has emerged in research with other populations (Table 2.6). Adjacent scales evidenced the strongest associations with each other. In contrast, the Maintenance scale is most highly correlated with the Contemplation scale. It is also

* This subject's data were utilized in the confirmatory factor analyses of the Processes of Change and Coping scales because she did not evidence extreme scores on these measures and because the outlier was discovered subsequent to these analyses.

more highly correlated with the Precontemplation scale than is the Action scale. If the scale were measuring the construct of Maintenance as it has with other populations, it would have evidenced its highest correlation with the Action scale.

Table 2.6
Pearson correlations among URICA scales.

	Precontemplation	Contemplation	Action	Maintenance
Precontemplation	1.00			
Contemplation	-.28	1.00		
Action	-.17	.52	1.00	
Maintenance	-.21	.65	.44	1.00

The URICA and the Algorithm Stages of Change

To understand the relationship between the algorithm stage measure and the continuous scales, it was important to determine whether subjects classified by the algorithm into different stages also exhibited different patterns of scores on the continuous stage (URICA) scales. If the URICA and the algorithm both measure the same phenomena, one would expect a clear pattern of results. Those in a particular algorithm stage should achieve their highest URICA scores on the corresponding stage subscale. They should achieve their next highest scores on adjacent subscales and their lowest scores on non-adjacent subscales. For example, those classified by the algorithm as Precontemplators should obtain their highest URICA scale scores on the Precontemplation scale. They should obtain their next highest scores on the Contemplation scale and their lowest scores on the Action scale. Of course, one would only expect this pattern among the three subscales which were confirmed by the factor analysis. Also, since there is no Preparation subscale, one might assume that those in this group would achieve their highest scores on Contemplation and Action.

In order to examine these relationships, each subject's scores on each of the four scales were used as the dependent variables in a MANOVA with algorithm stage as the grouping variable. The MANOVA was significant, Wilks Lambda (16, 776.62) = .83; $p < .0001$. Univariate F-tests indicated significant differences across stages for the Contemplation and Action subscales only. Tukey comparisons are listed below in Table 2.7.

Table 2.7
Mean URICA scale scores for subjects in each of the five stages of change.

URICA Scales	Precontem-plation (n = 52)	Contem-plation (n = 43)	Preparation (n = 77)	Action (n = 42)	Main-tenance (n = 47)	F test	Tukey comparisons
	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	F(4, 257) Signif.	
Precontem-plation	51.42 (11.14)	50.57 (10.82)	48.65 (10.18)	48.39 (8.62)	50.43 (7.14)	.96 n.s.	-
Contem-plation	47.43 (11.69)	50.60 (8.53)	52.40 (8.20)	50.80 (10.10)	48.65 (9.76)	2.47 $p < .05$	PC < PA
Action	44.53 (10.69)	48.38 (9.76)	51.63 (8.46)	52.45 (9.49)	53.83 (8.14)	8.19 $p < .001$	PC<PA,A,M C < M
Maintenance	48.31 (10.88)	49.81 (8.52)	52.76 (8.19)	49.90 (10.70)	49.46 (10.43)	1.96 n.s.	-

While there were no significant differences on either the Maintenance or Precontemplation scales, all of the significant differences on the other scales were consistent with the predictions of the model. Precontemplators achieved the lowest scores on all subscales except for the Precontemplation scale on which they obtained the highest scores. On the URICA Contemplation scale, Prepared subjects scored significantly higher than Precontemplators. In other words, those subjects who stated on the algorithm that they intended to give up illicit drugs in the next 30 days endorsed URICA items consistent with this intention, indicating that they were thinking more

seriously than Precontemplators about the possibility of changing their behavior. On the URICA Action scale, subjects in the Preparation, Action and Maintenance stage scored significantly higher than subjects in the Precontemplation stage while subjects in the Maintenance stage also scored significantly higher than subjects in the Precontemplation scale. Thus, those subjects in the latter stages of change indicated more strongly than those in the earlier stages that they were taking action to address their drug problems. The same results are presented in graphical form below in Figure 3.4.

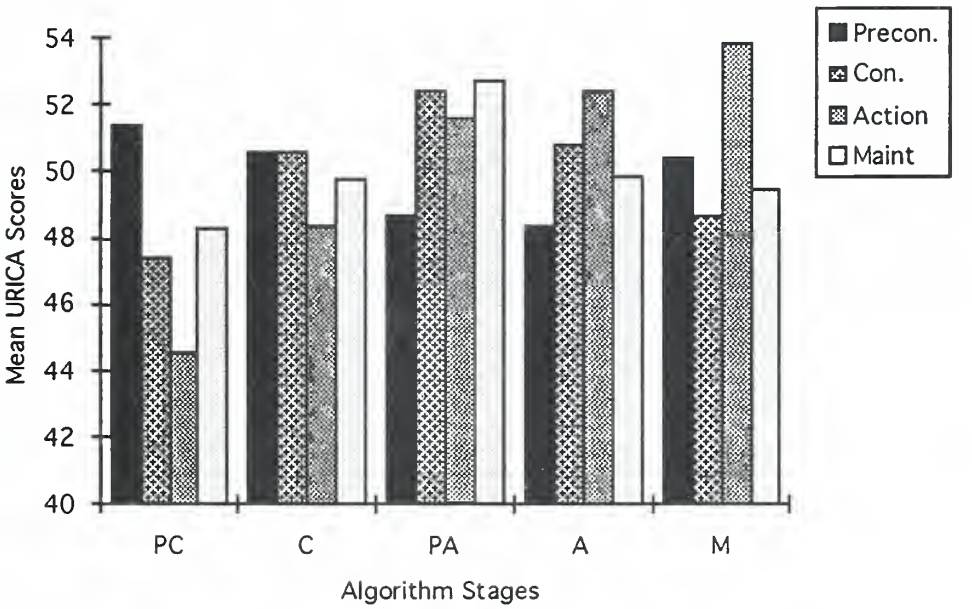

Figure 3.4. Mean URICA scale profiles for subjects in each of the five stages of change.

While the MANOVA demonstrated that many of the differences among the subscale scores were not statistically significant, the graph illustrates that, to a large degree the trends among the profile patterns are consistent with expectations, particularly when one disregards the Maintenance subscale scores. Those subjects in

the Precontemplation algorithm stage obtained their highest scores on the Precontemplation URICA subscale and their lowest scores on the Action subscale. Their Contemplation subscale scores fell between these two extremes. These subjects indicated by their responses that they were not particularly aware of the existence of a problem, that they were not inclined to give much thought to changing their behavior and that they were even less inclined to take action. Those classified as Contemplators on the algorithm obtained their highest scores on the Contemplation and Precontemplation subscales. Their responses suggest that they were not taking much action to change their drug using behavior, but that they were thinking more about changing than were the Precontemplators. Those in the Action algorithm stage obtained their highest scores on the Action subscale. Their responses suggest that while they were thinking about changing their behavior, they also saw themselves as taking action to change. Disregarding the Maintenance subscale, those in the Preparation algorithm stage obtained their highest mean scores on the Contemplation and Action subscales.

In the absence of a valid Maintenance scale, it would be difficult to make specific predictions for subjects in the Maintenance algorithm stage. Nonetheless, this group produced a somewhat unexpected pattern, obtaining their highest scores on the Action and Precontemplation subscales. This pattern of responses suggests that these subjects acknowledged taking action to address their drug problems while at the same time tending to deny the existence of such problems. This issue will be reviewed in greater detail in the discussion and in Study 3.

Though the URICA and the algorithm are both supposed to assess stage of change, no published studies have directly compared them. To test the convergent validity of the two stage measures, subjects were categorized into a stage on the basis of

their highest URICA subscale. Thus, those subjects who obtained their highest score on the Precontemplation subscale were assigned to the Precontemplation group; those who obtained their highest scores on the Contemplation subscale were assigned to the Contemplation group, etc. If the two instruments measure the same phenomena, one would expect a high degree of overlap between these two methods of classification. The results are summarized below in Table 2.8.

Table 2.8
Number of subjects in each category: classification by stage algorithm vs. classification by highest URICA scale T-score.

Highest URICA Scale T-score	Algorithm Stages				
	Precon.	Con	Prep.	Action	Maint.
Precontemplation	25	12	19	8	12
Contemplation	10	9	10	9	1
Action	5	8	18	11	21
Maintenance	12	14	31	14	13

The two measures evidenced little convergence. Ignoring the Prepared subjects (for which there is no corresponding URICA scale) and taking algorithm stage as the criterion, a total 58 of 184 (32%) subjects were classified correctly, yielding a Cohen's kappa value of only .08. Of subjects classified as Precontemplators by the algorithm, 48% were classified correctly by the URICA. Only 21% of algorithm Contemplator's were classified correctly by their URICA scores, while 26% of those in the Action stage and 27% of those in the Maintenance stage were classified correctly.

Since the Maintenance scale of the URICA failed to be confirmed, the convergence of the two measures was examined again without reference to Maintenance stage scores. This resulted in a reclassification of the 84 subjects who obtained their highest URICA score on the Maintenance scale, but it did little to improve the

convergence of the two measures. The results of this analysis summarized below in Table 2.9.

Table 2.9
Number of subjects in each category: classification by stage algorithm vs. classification by highest URICA scale T-score (excluding Maintenance scale scores).

Highest URICA Scale	Algorithm Stages				
	Precon.	Con	Prep.	Action	Maint.
Precontemplation	26	14	22	10	13
Contemplation	18	16	26	14	6
Action	8	13	30	18	29

Ignoring subjects classified by the algorithm in both the Preparation and Maintenance stages and taking the algorithm stage as the criterion, 60 of 137 subjects or 44% were correctly classified, yielding a Cohen's kappa value of .15. At this point, it remains to be determined exactly what the URICA is measuring, but these results suggest it is not the same thing as the stage algorithm, at least in this population.

URICA Scales and Demographic Variables

As with the Algorithm stages, a series of analyses were conducted to determine whether there was a relationship between the URICA scales and demographic variables. To examine the relationship between the scales and the categorical demographic variables, a MANOVA was conducted with URICA scale scores as the dependent variable and the following variables defining groups: sex; ethnic background; marital status; G.E.D. status; and employment status. Only main effects were examined since an examination of interaction effects would have resulted in many cells with very few subjects. The MANOVA was significant for two of the categorical variables: G.E.D. status, Wilks Lambda (4, 123) = .86; $p < .001$); and marital status, Wilks Lambda (20,

408.89) = .76, $p < .05$. However, none of the univariate F tests was significant for marital status, suggesting no differences in URICA scale scores among subjects in different marital status categories. For G.E.D. status, the univariate F tests indicated significant differences on the Precontemplation subscale only, $F(1, 271) = 19.01$, $p < .0001$. Subjects who reported graduating from high school or receiving their G.E.D. scored slightly lower on this scale than did subjects who did not (mean = 47.85 vs. mean = 52.97).

Pearson correlations were examined to investigate the relationships between the four URICA scales and the following continuous demographic variables: age, level of education, number of take-home bottles of medication, years of drug use, years of opiate use and months in methadone maintenance treatment. Using Bonferroni's adjustment, only one of these correlations was significant. Precontemplation scale scores and level of education were negatively correlated, $r = -.25$, $p < .001$. This finding is consistent with the finding regarding G.E.D. status and indicates that subjects with more education were likely to score somewhat lower on the Precontemplation scale. In contrast with the algorithm stages, no significant correlations emerged between the URICA scores and time in treatment .

URICA and Self-Reported Drug Use

If the scales are valid, they should correlate with drug use variables. In particular, high scores on Precontemplation and Contemplation could be expected to be associated with more drug use, since subjects in these stages are supposed to have not yet begun to change. On the other hand high scores on Action and Maintenance should be associated with less drug use. The actual Pearson correlations between these scales and self reported use of the five classes of drugs are listed in Table 2.10.

Table 2.10

Pearson correlations between URICA scale scores and days of acknowledged drug use in the past 30.

Type of Drug Use	Precontem-plation	Contemplation	Action	Maintenance
opiates	.00	-.04	-.23**	-.05
cocaine	.04	-.08	-.15*	.02
benzodiazepines	-.04	-.01	-.14*	.02
marijuana/hashish	-.01	-.04	-.04	.03
other	-.10	-.01	-.02	.04
combined drug use	-.03	-.07	-.24**	.01

* $p < .05$ ** $p < .01$

Only the Action scale produced statistically significant correlations with the drug use variables. High scores on the Action scale were associated with less reported use of opiates, cocaine, benzodiazepines, and all drug categories combined. A series of regression analyses with combined drug use as the dependent variable and all four of the URICA scale measures as dependent variables indicated that Action and Maintenance were both significant predictors of reported drug use, though together, they accounted for only 7% of the variance in combined drug use.

Dependent variable = combined drug use

URICA scale scores	Beta	T	Significance
Action	-.31	-4.73	$p < .0001$
Maintenance	.14	2.18	$p < .05$

Adjusted $R^2 = .07$

This result highlights the problem with the Maintenance scale. For patients with equal scores on the Action scale, higher scores on the Maintenance scale are associated with more drug use.

PROCESSES OF CHANGE MEASURE

Factor Confirmation and Scale Construction

As with the URICA, the factor structure of the processes of change measure has been supported in several different populations. At least one study utilized confirmatory procedures to verify the factor structure of a version of this measure designed for use with smokers (Prochaska, et al., 1988). Previous studies have demonstrated similar, though not identical, factor structures in several different populations. To determine whether the twelve hypothesized scales would emerge as distinct factors with this population, the Processes of Change Questionnaire was analyzed using EQS (Bentler, 1991). Due to a clerical error, the questionnaire was not administered to one of the subjects, leaving a sample size of 275 subjects for these analyses.

The initial twelve factor model failed to achieve an adequate fit with the data. The maximum likelihood solution yielded a significant chi-square goodness-of-fit value, χ^2 (1644, $\underline{N}$ = 275) = 3086.02 , $p < .001$. Alternate indices of goodness-of-fit were as follows: Bentler-Bonett Normed Fit Index = .62; Bentler-Bonett Nonnormed Fit Index = .76; Comparative Fit Index = .77. As with the four-factor model for the URICA, part of the problem with this model derived from high correlations among the factors. In this analysis, correlations between two sets of factors (Consciousness Raising and Self Reevaluation as well as Self Reevaluation and Dramatic Relief) had to be constrained at the upper bound of 1 while eight other correlations reached a value of .90 or greater. (See Appendix M for a complete list of correlations among the twelve hypothesized factors.)

The model was respecified in a manner consistent with previous research and theory as well as the present findings; the twelve hypothesized factors were consolidated into six factors. In the respecified model, the items from the first four scales (Consciousness Raising, Dramatic Relief, Environmental Reevaluation, and Self Reevaluation) were combined to form a single factor. These four hypothesized processes were all highly correlated with each other (all intercorrelations greater than .90). They are related to each other theoretically in that they all involve raising one's awareness of a problem and assessing it's impact on one's self and others. In addition, these factors have been related to each other empirically in that previous research with other populations suggests that they are most widely utilized in the earliest stages of the change (see Figure 1.2). Items from Factors 8, 9 and 10 (Interpersonal Stimulus Control, Stimulus Control and Counterconditioning) were also combined to form a single factor in the new model. These three factors also exhibited high intercorrelations (.95, .93, .80). They all relate to behaviorally oriented treatments and have been shown to mediate the transition from Action to Maintenance (see Figure 1.2).

The items from Factors 6 and 7 (Helping Relationships and Reinforcement Management) were also combined to form a single factor in the respecified model. These two original factors exhibited an intercorrelation of greater than .90. Previous research indicates that Helping Relationships and Reinforcement Management should be most widely utilized in the Action and Maintenance stages of change, though on the basis of theory, one might assume that Reinforcement Management would be more closely related to the other behavioral processes then to Helping Relationships. Inspection of the items which make up the scale reveals that four of the five items involve being rewarded by others for avoiding drug use. In this respect, the item

content bears considerable similarity to that of the hypothesized Helping Relationships scale.

The remaining three factors were left unchanged in the respecified model, because there was no clear rationale for combining them. Factors 5 and 12 (Self Liberation and Medication) did not evidence correlations of greater than .90 with any other factors and neither theory nor previous research suggested close relationships with other factors. Factor 11, Social Liberation evidenced correlations of .90 or above with theoretically disparate factors (F1 Consciousness Raising and F10 Interpersonal Stimulus Control) and high correlations with several other factors as well.

The respecified model incorporated all 60 items into the six factors described above; however, it fit the data little better than the original model. The maximum likelihood solution yielded significant chi-square goodness-of-fit value, χ^2 (1695, $\underline{N}$ = 275) = 3275.64, $p < .001$, with the following alternate goodness of fit indices: Bentler-Bonett Normed Fit Index = .60; Bentler-Bonett Nonnormed Fit Index = .74; Comparative Fit Index = .75). Inspection of the results indicated that two of the factors (Social Liberation and Medication) remained weakly identified. Neither of these factors included more than two items with loadings above .50. In retrospect, it was not surprising that the Medication items failed to load together. Two of the items involved behavior which is actually encouraged in most methadone clinics (i.e. requesting a higher methadone dose to avoid drug use) while the other three items describe behavior which would be considered inappropriate in most clinics. The inadequacy of the Social Liberation factor is also not surprising in light of the disparate types of activities which this construct is supposed to represent. The items making up both the Medication and Social Liberation scales were dropped from subsequent analyses.

The model was respecified a second time, eliminating the two weakly identified factors mentioned above. In order to reduce the number of items and to eliminate those items which failed to contribute significantly to the identification of their particular factors, this third model included only those items with factor loadings of .60 or above. These modifications reduced the total number of items to 25 (Appendix N). The first factor (which will hereafter be termed Reevaluation) consisted of seven items - three from the hypothesized Environmental Reevaluation scale, two from Self Reevaluation, one from Dramatic Relief and one from Consciousness Raising. The second factor (Self Liberation) consisted of three items - all from the hypothesized Self Liberation scale. The third factor (hereafter termed Reinforcing Relationships) consisted of seven items - four from the hypothesized Reinforcement Management scale and three from Helping Relationships. The final factor (hereafter termed Behavioral Processes) consisted of eight items - three from the hypothesized Counterconditioning Scale, three from Interpersonal Stimulus Control, and two from Stimulus Control.

This third model fit the data considerably better than the previous two. The maximum likelihood solution again yielded a significant chi-square goodness-of-fit value, χ^2 (269, $\underline{N}$ = 275) = 543.25, $p < .001$. However the alternate fit indices approached or exceeded the .90 value cited as desirable by Bentler: Bentler-Bonett Normed Fit Index = .83; Bentler-Bonett Nonnormed Fit Index = .90; Comparative Fit Index = .91. (See Appendix N for a complete list of the final items with their factor loadings and a path diagram of the final model.) On the basis of these scores, it was determined that this substantially respecified model fit the data adequately.

Four processes of change scales were created in the same manner as the URICA scales by combining the items which made up the factors in the final model. The

Reevaluation scale represents activities which involve reevaluating the impact of one's drug problem on oneself and others. These may include educational or emotional experiences which highlight the risks to life and health posed by addiction. They also include simple reflection on the extent to which illicit drug use harms loved ones or conflicts with one's own values. The second scale consists entirely of items taken from the hypothesized Self Liberation factor. It assesses activities related to making the choice and the commitment to refrain from illicit drug use. The Reinforcing Relationship scale assesses activities which involve spending time with people who provide support and reinforcement for abstinence. The Behavioral Processes scale represents making changes in behavior to achieve and maintain abstinence. Such behaviors include substituting other activities in place of drug use, avoiding people, places and situations which trigger or exacerbate the desire to use drugs.

Scores on these scales were calculated by taking the average of the individual item scores for each scale. If a subject had missing data on one of the items in a particular scale, the average of the remaining items was computed. These calculations resulted in four processes of change scores for each subject with values ranging from 0 to 5. The scales demonstrated a high degree of internal consistency, yielding Cronbach's alpha coefficients equal to or exceeding .70. These figures along with the means and standard deviations are listed in Table 2.11 below. For all subsequent analyses, the Processes of Change scale scores were converted to T scores with a mean of 50 and a standard deviation of 10.

Table 2.11
Means, standard deviations, and Cronbach's alpha coefficients for each of the Processes of Change scales prior to conversion to T-scores.

Process Scale	M	SD	Cronbach's alpha
Reevaluation	3.71	.82	.83
Self Liberation	3.54	.98	.70
Reinforcing Relationships	3.20	.98	.86
Behavioral Processes	3.36	.93	.89

Table 2.12 indicates that the scales are relatively highly correlated with one another. Behavioral Processes and Self Liberation evidence the highest intercorrelation.

Table 2.12
Pearson correlations among the Processes of Change scales.

	Reevaluation	Self Liberation	Reinforcing Relationships	Behavioral Processes
Reevaluation	1.00			
Self Liberation	.56	1.00		
Reinforcing Relationships	.49	.55	1.00	
Behavioral Processes	.49	.68	.58	1.00

The Processes of Change and the Stages of Change

Prochaska and DiClemente's model predicts that individuals in different stages of change should utilize different process of change. Specifically, subjects in the earlier stages of change (Precontemplation and Contemplation) should make use of the Reevaluation Process primarily. These individuals have not yet begun to change their behavior, but they may be assessing the consequences of their drug use and considering the need for change. Subjects in the Preparation and Action stages should employ the process of Self Liberation as they make the decision to stop using drugs. Subjects in

the Action and Maintenance stages should engage in activities represented by the Behavioral Process scale to effect and maintain changes in their drug using behavior. Subjects in any of the stages might look for support to relationships with others; however since this process scale involves relationships which reinforce abstinence, one would expect subjects in the Action and Maintenance stages to utilize it most.

To examine these possible relationships, a MANOVA was performed with process scores as the dependent variables and algorithm stages as the grouping variable. The MANOVA was significant, Wilks Lambda (16, 773.57) = .76; $p < .001$. Univariate F tests were significant for each of the scales except the Reevaluation scale. These results and Tukey comparisons are listed below in Table 2.13.

Table 2.13
Mean Processes of Change scale scores for subjects in each of the five stages of change.

Processes of Change Scales	Precontem-plation (n = 52)	Contem-plation (n = 43)	Preparation (n = 77)	Action (n = 42)	Main-tenance (n = 47)	F test (4, 256)	Tukey comparisons
	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	F Signif.	P < .05
Reevaluation	48.62 (10.06)	49.18 (10.39)	51.46 (9.46)	50.99 (9.70)	49.69 (10.07)	-	-
Self-Liberation	43.09 (9.80)	46.91 (8.06)	52.00 (8.58)	53.60 (9.50)	53.68 (9.29)	13.42 p < .0001	PC,C<PA,A, M
Reinforcing Relationships	46.26 (8.83)	47.95 (8.64)	50.38 (10.11)	52.07 (10.50)	53.59 (10.20)	4.52 p < .01	PC < A, M C < M
Behavioral Processes	45.47 (8.82)	45.89 (9.52)	50.51 (9.78)	52.89 (8.74)	54.58 (9.59)	8.99 p < .0001	PC < PA,A,M C < A, M

In general, the results were consistent with the Prochaska et al. model. All of the significant differences were in the predicted directions. The lack of significant differences in Reevaluation suggests that subjects engaged approximately equally in the process of reevaluating the impact of their illicit drug use; however subjects in the later

stages indicated that they were taking more action to change. Subjects in the Action and Maintenance stages of change scored significantly higher than subjects in the Precontemplation stage on the use of all the processes except Reevaluation and higher than subjects in the Contemplation stage on the use of Behavioral Processes. Prepared subjects distinguished themselves from subjects in the first two stages by their high scores on the use the Self Liberation process.

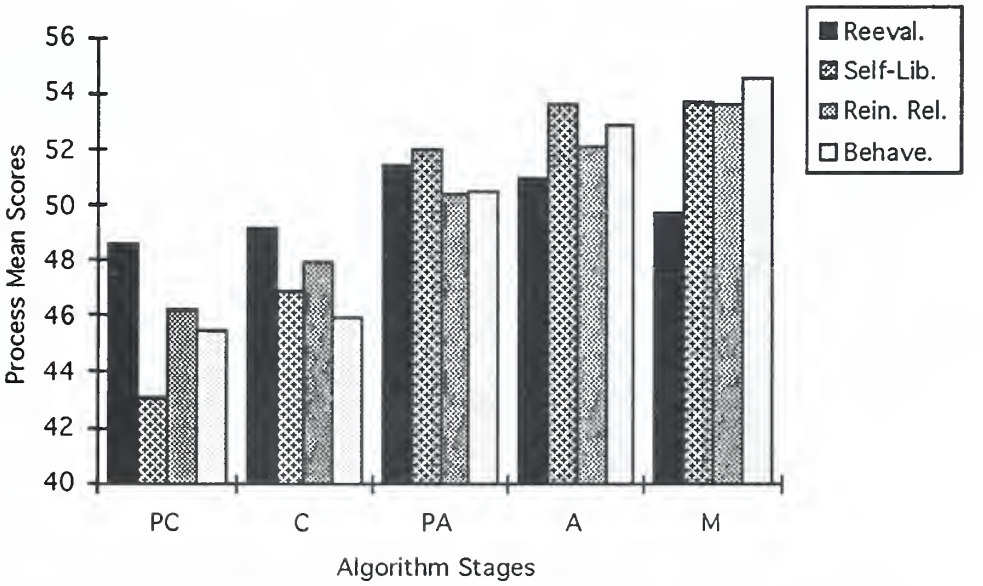

Figure 3.5. Mean Processes of Change scale profiles for subjects in each of the five stages of change.

Figure 3.5 better illustrates the relationship between the algorithm stage categories and the process scales. Although subjects in the Precontemplation and Contemplation stages did not score higher than other subjects on Reevaluation, they did obtain their highest scores on this scale as the model would predict. Previous research with other populations has suggested that the transition from Preparation to Action is mediated by Self-Liberation - that is the process of consciously making the commitment

to change their behavior. The results obtained here are consistent with this finding in that those in the Preparation and Action stages obtained their highest mean scores on the Self-Liberation scale. Those in the Maintenance stage obtained their highest scores on the behavioral processes which are hypothesized to be most useful in maintaining behavior change.

The Processes of Change and Demographic Variables

As with the previous measures, a series of analyses was conducted to examine possible relationships between the process scales and demographic variables. A MANOVA was conducted with process scale scores as the dependent variable and the following variables defining groups: sex; ethnic background; marital status; G.E.D. status; and employment status. Again, only main effects were examined. The MANOVA indicated no significant effects for any of these variables. The scales also did not correlate significantly with any of the continuous demographic variables.

The Processes of Change and Self Reported Drug Use

If the processes of change have clinical relevance, they should demonstrate some association with recent drug use. Prochaska and DiClemente's model would predict that subjects who report making greater use of Self Liberation, Reinforcing Relationships, and Behavioral Processes should be less likely to be using drugs. On the other hand, one might expect a positive correlation between Reevaluation and drug use, since the processes represented by this scale are associated with the earliest stages of change in which individuals may be only contemplating discontinuation of their drug use. To test these hypotheses Pearson correlations were calculated between the process scales and the self reported drug use variables. The results are listed in Table 2.14.

Table 2.14
Pearson correlations between Processes of Change scales and number of days of acknowledged drug use in the past 30.

Days of acknowledged drug use in the past 30 days.	Reevaluation	Self Liberation	Reinforcing Relationships	Behavioral Processes
opiates	-.11	-.19**	-.23**	-.30**
cocaine	.01	-.13*	-.09	-.19**
benzodiazepines	.11	-.12	-.01	-.03
marijuana/hashish	-.04	-.02	-.03	-.07
other	.07	-.06	-.03	-.01
combined drug use	.00	-.21**	-.17**	-.26**

*p < .05 **p < .01

The results were generally consistent with these the model's predictions. The Behavioral Processes, Reinforcing Relationships, and Self Liberation all produced modest but significant negative correlations with reported opiate use and combined drug use over the past 30 days. Subjects who reported more frequent use of these processes also reported less drug use. A series of regression analyses indicated that Helping Relationships and Self Liberation did not explain any additional variance in recent drug use after the Behavioral Processes variable was entered into the equation. However, after controlling for Behavioral Processes scores, a positive association emerged between Reevaluation and drug use. The final equation with the best two predictors is listed below. This finding suggests that Reevaluation, by itself, is not associated with more drug use. Rather those subjects who report the greatest amount of drug use are those who engage in Reevaluation without also using the Behavioral Processes to address their drug problems.

Dependent variable = combined drug use

Process Scores	Beta	T	Significance
Behavioral Processes	-.33	-5.03	$p < .0001$
Reevaluation	.16	2.37	$p < .05$

Adjusted R Square = .08.

To determine which of the stage and process variables contributed uniquely to accounting for the variance in recent drug use, all of the stage and process continuous variables were entered into a step-wise regression analysis with combined drug use as the dependent variable. Behavioral Processes, Reevaluation, and the Action stage scale all made significant and unique contributions to predicting reported combined drug use. Behavioral Process evidenced the strongest relationship with recent drug use followed by the URICA Action scale. The negative coefficient corresponding to the Reevaluation scale again suggests, in the absence of some kind of action, high scores on Reevaluation are associated with greater amounts of recent drug use. Taken together, these three variables (Behavioral Processes, the URICA Action scale, and Reevaluation) accounted for 11% of the variance in self-reported use of illicit drugs during the 30-day pretest period.

Dependent variable = combined drug use

Process Scores	Beta	T	Significance
Behavioral Processes	-.27	-3.96	$p < .0001$
Action (URICA)	-.19	-3.05	$p < .01$
Reevaluation	.18	2.80	$p < .01$

Adjusted R Square = .11

COPE

Factor Confirmation and Scale Construction

The study describing the development of this instrument included a principal-factors factor analysis which supported the validity of 11 of the 13 original scales (Carver, et al., 1989). The alcohol and drug use scale had not yet been developed, and in two instances, items from related scales loaded together. The Active Coping and Planning scales loaded together as did the two separate Social Support scales. Unlike the previous measures, the COPE does not appear to have been used with substance abusers, though similar scales have been used in many studies to assess coping strategies in a variety of populations. It remained to be determined whether the hypothesized fourteen factors could be confirmed with a methadone maintenance population. Data from all 276 subjects were used in the analyses (See Appendix K for details regarding the handling of missing data.).

As with the other scales in this study, the original fourteen factor model of the COPE scale failed to provide an adequate fit with the data and again, the problem involved high correlations among several of the factors. The maximum likelihood solution yielded a significant chi-square goodness-of-fit value, χ^2 (1393, N=276) = 2314.34, $p < .001$; Bentler-Bonett Normed Fit Index = .65; Bentler-Bonett Nonnormed Fit Index = .80. Comparative Fit Index = .82. In this model, the correlation between two of the factors (F2 -Active Coping and F3 - Planning) had to be constrained at the upper bound of 1. This is consistent with the initial findings of Carver et. al.; however several of the other factors were also highly intercorrelated. The intercorrelations among all of the scales are listed in Appendix O.

The first three factors, Positive Reinterpretation and Growth, Active Coping, and Planning all correlated with each other at levels above .90. This occurred despite the fact that Positive Reinterpretation is supposed to be an emotion-focused coping style while Active Coping and Planning are problem-focused. Nonetheless, all three involve actively working to change either one's circumstances or one's attitude. Factors 6 and 13, Suppression of Competing Activities and Restraint Coping, were also highly correlated with each other (r = .98). They bear a theoretical relation to each other in that they both involve inhibition of action.

The model was respecified with only 11 factors - nine of the original scales and two factors made up of combinations of the original scales. One of these new factors consisted of all the items from the first three factors. The other combined factor consisted of items from factors 6 and 13. This respecified model also failed to produce acceptably high indices of goodness of fit. Inspection of the results indicated that two of the factors (Acceptance and Mental Disengagement) were very weakly identified, each including only one item with a factor loading above .50. The items from both of these scales were dropped from subsequent analyses. For the first combined factor, three of the four top-loading items came from the original Planning scale. For this reason, items from the other two scales (Positive Reinterpretation and Active Coping) were dropped from subsequent analyses. In the case of the second combined factor, three of the four top-loading items came from the Suppression of Competing Activities scale. The items from the Restraint Coping scale were subsequently dropped from further analyses.

The model was respecified a second time with only nine factors. This model was the same as the original model except that four scales were dropped as indicated

above. The maximum likelihood solution again yielded a statistically significant chi-square goodness of fit value, χ^2 (558, N=276) = 815.58, $p < .001$. However the alternate goodness of fit indices indicated that this nine-factor model fit the data adequately: Bentler-Bonett Normed Fit Index = .79; Bentler-Bonett Nonnormed Fit Index = .91; Comparative Fit Index = .92.

As with the previous measures, scales were created by combining the items which made up each of the nine factors in the model. Again, scores were calculated by averaging the individual item scores across scales. Missing data were handled as before. If a subject had missing data on one of the items in a particular scale, the average of the remaining items was computed. Each of the resulting scales had values which could range from 0 to 4. See Table 2.15 for means, standard deviations and Cronbach's alpha measures for each scale. These scores were converted to T scores with a mean of 50 and a standard deviation of 10.

Table 2.15
Means, standard deviations, and Cronbach's alpha coefficients for COPE scales prior to conversions to T-scores.

Cope Scale		M	SD	Cronbach's alpha
F3	Planning	2.88	.76	.78
F4	Seeking Emotional Social Support	2.54	.78	.74
F5	Seeking Instrumental Social Support	2.70	.76	.75
F6	Suppression of Competing Activities	2.56	.62	.54
F7	Turning to Religion	2.88	.95	.88
F10	Focus on and Venting of Emotions	2.66	.71	.64
F11	Behavioral Disengagement	2.03	.72	.69
F12	Denial	1.89	.79	.69
F14	Drug/Alcohol Use	2.17	.96	.87

The Cronbach's alpha coefficients indicate that these scales evidenced greater internal consistency than the URICA or the Processes of Change scales. The correlations among the scales listed in Table 2.16 indicate relatively strong associations among all of the first six scales. Thus despite the fact that Carver et al. conceived the Focusing on and Venting Emotions strategy as a maladaptive one, in this population, it evidences a relatively high correlation with the strategies which are supposed to be more adaptive. Denial, on the other hand, is strongly correlated with Behavioral Disengagement and moderately correlated with Alcohol and Drug Use, both of which were conceived as maladaptive strategies.

Table 2.16
Pearson correlations among COPE scales.

	Planning	Emot. Support	Instrm. Support	Sup-pression	Religion	Vent Emot.	Behav. Diseng.	Denial	Alcohol/ Drug
Plan-ning	1.00								
Emot. Support	.53	1.00							
Instrm. Support	.56	.59	1.00						
Sup-pression	.48	.39	.46	1.00					
Religion	.33	.34	.36	.27	1.00				
Vent Emot.	.36	.39	.43	.40	.26	1.00			
Behav. Diseng.	-.25	-.30	-.08	.10	.07	.11	1.00		
Denial	-.10	.07	.04	.25	.21	.16	.52	1.00	
Alcohol/ Drug	-.23	-.19	-.13	.00	-.06	.07	.41	.27	1.00

COPE and the Stages of Change

The relationship between the COPE and the algorithm stages of change was examined as a means of assessing the external validity of the constructs measured by both instruments. It was difficult to make many specific predictions on the basis of the Prochaska model because while coping styles may be dispositional, the stages of change were conceived as transitory. An individual can move among them at any time on the road to recovery or relapse. Nonetheless, one might predict that those in the earlier stages of change would be more likely to make greater use of the more maladaptive coping strategies - alcohol and drug use, denial, and behavioral disengagement. On the other hand, those in the later stages might be likely to make more use of social support, might exercise more restraint, and might be better able to plan ahead. To assess these relationships, a MANOVA was conducted with the COPE scales as the dependent measures and algorithm stage as the grouping variable. The MANOVA was significant, Wilks Lambda (36, 934.86) = .73, $p < .001$. Univariate F tests indicated significant differences across stages for four of the nine COPE scales (Table 2.17).

Table 2.17
Mean COPE scores for subjects in each of the five stages of change.

COPE Scales	Precontem-plation (n = 52)	Contem-plation (n = 43)	Preparation (n = 78)	Action (n = 42)	Maintenance (n = 47)	F test (4, 257)	Tukey comparisons
	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	F Signif.	P < .05
Planning	46.34 (11.10)	50.17 (9.68)	49.34 (9.18)	50.61 (9.77)	53.91 (8.59)	3.91 p < .01	PC < M
Emotional Social Support	46.82 (10.17)	48.08 (8.42)	49.41 (9.77)	49.94 (10.25)	55.26 (9.94)	5.26 p < .001	PC,C,PA<M
Behavioral Disengagement	53.23 (9.77)	51.55 (10.33)	49.25 (9.94)	47.21 (8.29)	50.11 (10.45)	2.59 p < .05	PC > A
Alcohol / Drug Use	54.89 (10.09)	51.83 (8.92)	51.44 (8.92)	47.37 (9.55)	44.71 (9.84)	8.78 p < .0001	PC,C,PA>M PC > A

As with the other continuous measures, all of the significant differences occurred in a manner consistent with the model. Those in the later stages indicated that they were more likely to use the more adaptive coping strategies than were those in the earlier stages. At the same time, those in the earlier stages indicated that they were more inclined to use the less adaptive strategies than were those in the later stages. Subjects in the Action stage scored significantly lower than Precontemplators on Behavioral Disengagement and on Alcohol and Drug Use. Maintainers scored significantly higher than subjects in any of the first three stages on Seeking Social Support for Emotional Reasons and significantly lower on Alcohol and Drug Use. Maintainers also scored significantly higher than Precontemplators on the Planning scale.

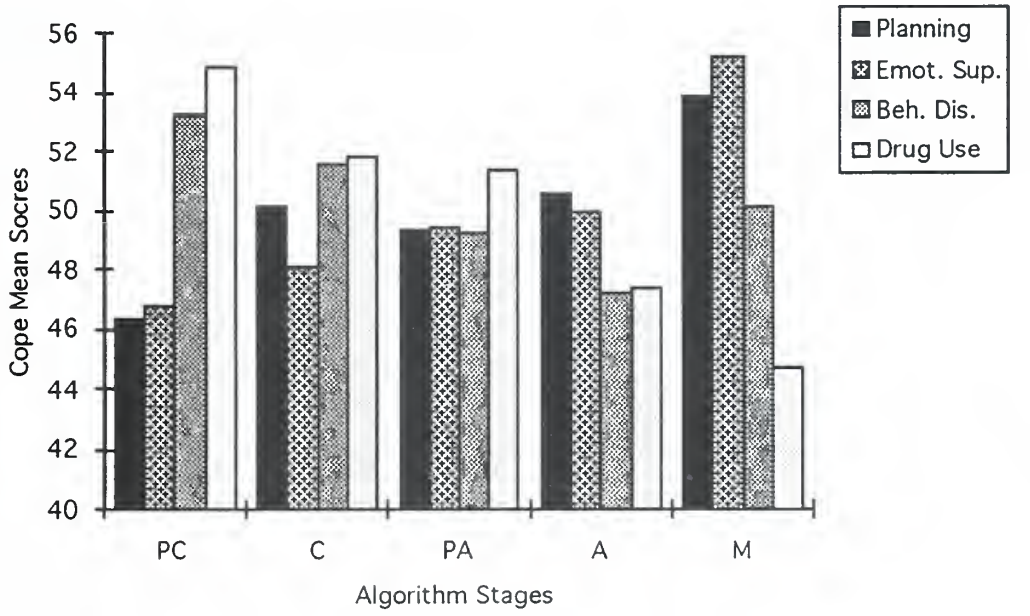

Figure 3.6. Mean COPE scale profiles for subjects in each of the five stages of change.

Figure 3.6 illustrates that the mean profile of subjects in the Precontemplation stage is characterized by high scores on Drug/Alcohol Use and Behavioral Disengagement accompanied by low scores on Planning and Seeking Social Support for

Emotional Reasons. In contrast, the mean profile of subjects in the Maintenance stage features high scores on these two adaptive strategies. The mean profiles of the other stages are somewhat less distinctive, though subjects in the Action stage did evidence greater use of the more adaptive strategies relative to the less adaptive strategies. It makes sense that Precontemplators and Maintainers would be the most clearly distinguished from each other and from the other stages since the COPE measures more stable attributes and these two stages are perhaps inherently more stable than the other stages, at least with respect to illicit drug use. By definition, Precontemplators plan to make no change in this area for at least six months while Maintainers have abstained for six months.

COPE and Demographic Variables

As with the other scales, it was important to determine if any of the COPE scales bore a strong association with demographic variables. To assess the relationship between the scales and the categorical demographic variables, a MANOVA was conducted with COPE scale scores as the dependent variables and with groups defined by the following variables: sex; ethnic background; marital status; G.E.D. status; and employment status. Again, only the main effects of the variables were examined. The MANOVA was significant for ethnic background only, Wilks Lambda (36, 484.00) = .59, $p < .01$. Since there was a total of only 4 subjects in the ethnic categories of Asian and Native American, it would have been impossible to draw conclusions about either of these groups. Therefore, these subjects were not included in the univariate F-tests. These were significant for six of the nine processes (Table 2.18).

Table 2.18
Mean COPE scale scores for subjects in three different ethnic categories.

COPE Scales	White (w) (n = 145)	Black (b) (n = 100)	Hispanic (H) (n = 26)	F test (2, 268)	Tukey comparisons
	M (SD)	M (SD)	M (SD)	F Significance	P < .05
Planning	47.85 (10.38)	52.71 (9.37)	49.85 (10.02)	7.32 p < .001	w < b
Seeking Social Support for Emotional Reasons	47.76 (9.85)	52.82 (51.29)	51.29 (10.12)	8.30 p < .001	w < b
Seeking Social Support for Instrumental Reasons	48.45 (9.70)	52.35 (9.95)	50.34 (10.03)	4.59 p < .05	w < b
Suppression of Competing Activities	48.89 (10.40)	51.10 (9.48)	51.15 (9.69)	1.66 n.s	-
Religion	48.23 (10.77)	51.26 (9.07)	53.90 (10.04)	5.15 p < .01	w < H
Focus on and Venting of Emotions	48.97 (9.85)	50.55 (10.49)	52.58 (8.58)	1.78 n.s.	-
Behavioral Disengagement	50.65 (10.33)	48.80 (9.61)	50.68 (8.21)	1.12 n.s.	-
Denial	48.95 (9.68)	50.07 (10.11)	55.70 (10.00)	5.18 p < .01	w, b < H
Alcohol/Drug Use	51.21 (10.64)	49.06 (9.17)	46.57 (7.68)	3.11 p < .05	-

The results indicate that whites obtained the lowest scores on all but two of the coping strategies (Behavioral Disengagement and Alcohol/Drug Use). Whites scored significantly lower than blacks on the reported use of three of the adaptive coping strategies, Planning, Seeking Social Support for Emotional Reasons, and Seeking Social Support for Instrumental Reasons. White subjects scored significantly lower than Hispanics on the reported use of Religion and Denial. Tukey comparisons indicated no significant differences on Alcohol and Drug Use, though whites obtained the highest mean score on this scale.

Coping Strategies and Self Reported Drug Use

To determine the extent to which recent drug use might be associated with the use of different strategies as measured by the COPE, Pearson correlations were calculated between the nine confirmed COPE scales and the self-reported drug use variables (Table 2.19). One might predict that more adaptive coping strategies would be associated with less recent drug use, while the more maladaptive strategies might be related to more recent drug use.

Table 2.19
Pearson correlations between COPE scale scores and number of days of acknowledged drug use in the past 30.

Days of acknowledged drug use in the past 30 days.	Planning	Emot. Soc. Sup.	Inst. Soc Sup	Sup.of Comp. Act.	Religion	Vent. Emot.	Beh. Diseng.	Denial	Alc/ Drug Use
opiates	-.15*	-.20**	-.15*	-.13*	-.09	-.12	.05	.01	.28**
cocaine	-.04	-.04*	-.06	-.05	-.07	-.05	.05	.16**	.23**
benzodiazepines	-.03	-.07	.07	.05	.11	-.08	.13*	.10	.22**
marijuana/hashish	-.04	-.03	-.11	.03	-.03	-.04	-.08	-.07	.01
other	-.06	-.02	.03	.00	.02	-.03	.07	-.01	.17**
combined drug use	-.13*	-.16**	-.10	-.05	-.04	-.13*	.09	.08	.35**

* $p < .05$ ** $p < .01$

Perhaps not surprisingly, the use of alcohol and drugs as a coping strategy bore a significant association to reported drug use over the past 30 days. Those subjects who acknowledged drug and alcohol use as a frequently-used coping style also acknowledged more drug use than subjects who did not. This coping process accounted for over 12% of the variance in reported use of all drugs combined. This scale was more strongly associated with combined drug use than any of the other coping scales as well as any of the stage and process continuous measures. The other coping strategies associated with combined drug use were Planning, Seeking Social Support

for Emotional Reasons, and Focusing on and Venting Emotions. Subjects who reported frequent use of these processes reported less drug use than those who did not. A series of regression analyses was performed to determine the independent contributions of the coping scales in accounting for the variance in combined drug use. These analyses indicated that Focusing on and Venting Emotions was the only process that contributed to explanatory power after Alcohol/Drug Use was entered into the equation. Together, these two processes accounted for approximately 14% of the variance in reported drug use, slightly more than the 11% accounted for by the best combination of continuous stage and process measures.

Dependent variable = combined drug use

COPE scale	Beta	T	Significance
Alcohol/Drug Use	.36	6.431	$p < .0001$
Venting Emotions	-.16	-2.83	$p < .01$

Adjusted R Square = .14

These relationships held up even after ethnic background was entered into the equation as two dummy variables. White ethnic background did evidence a significant positive correlation with reported drug use, but it accounted for only an additional 1% of the variance after the two coping scales were entered into the equation. Taken together, the results suggest that the most important coping strategies with respect to reported illicit drug use in the past 30 days are Alcohol/Drug Use and Focusing on and Venting Emotions. Those subjects who report less recent drug use also report a greater tendency to experience and express emotional distress and a lesser tendency to use drugs in response to stress.

DISCUSSION

The study results provide a basis for assessing the validity of the Prochaska et al. model as it applies to opiate addicts in methadone maintenance. At the same time, this application of the model sheds light on the process of recovery in this population. Though the measures required some modification for use with this sample, the results provide at least qualified support for the model. Areas of divergence between the study data and the model's predictions point to limitations of the model, but they also highlight some of the particular problems of methadone maintenance treatment. The discussion which follows will focus first on the validation of the measures before turning to an examination of the characteristics of patients in the various stages of change based on the study results. It will touch on treatment implications and conclude with a consideration of the generalizability of the findings.

ALGORITHM STAGES OF CHANGE

The results of the study provide evidence that methadone maintenance patients can be divided into relatively distinct groups on the basis of their self-reported past drug use and their stated intentions to discontinue drug use in the future. The largest group of subjects fell into the Preparation stage, indicating that they planned to give up illicit drug use in the next 30 days. This is perhaps not surprising in light of the fact that although all subjects were participating in substance abuse treatment at the time of the study, by their own self report, the majority of them were still using illicit drugs. Since the purpose of treatment is, after all, to help patients discontinue illicit drug use, it makes sense that most of those still using drugs would indicate that they plan to quit soon.

What is more surprising (and disconcerting from the perspective of a treatment provider) is the large proportion of subjects classified into the Precontemplation stage. Rosenbloom's (1991) study with cocaine addicts suggested that it might be difficult to find many Precontemplators in treatment. However this was not the case in this sample of methadone maintenance patients. Despite the fact that they were all (ostensibly) participating in drug abuse treatment, 20% of subjects indicated that they had no intention of discontinuing illicit drug use in the next six months. It would appear that many patients remain in treatment with goals other than abstinence from illicit drugs.

CONTINUOUS MEASURES OF STAGES OF CHANGE - URICA

Confirmatory factor analyses failed to support the validity of the four hypothesized scales of the continuous stage measure in this sample of methadone maintenance patients, though a three-factor model fit the data adequately. Four-item versions of the Precontemplation, Contemplation, and Action scales were supported by the confirmatory procedures. It should be noted, however, that the model required some respecification before adequate goodness of fit indices were achieved. No items were switched from their hypothesized scale to any other scales to improve fit, but weakly loading items were eliminated. This procedure allows the possibility that the relatively high goodness of fit indices were at least partly due to chance. To insure against this possibility, the same scales would have to be confirmed in another sample.

The items comprising the hypothesized Maintenance factor failed to load together at high levels and the Maintenance factor itself was highly correlated with the Contemplation factor. This finding is noteworthy in that published studies utilizing this measure with other addicted populations have all supported its hypothesized four-factor structure. It is somewhat ironic that the Maintenance scale would fail to be validated

among subjects participating in a form of treatment designed specifically to help maintain changes in drug using behavior. Given the apparent similarity in content among the items on the Maintenance scale, it is puzzling that they failed to load together. Evidently, these items did not strike chords of recognition among the subjects in this sample. Interestingly, subjects in the Maintenance stage actually obtained relatively low scores on the URICA Maintenance scale. The highest scores on the Maintenance scale were obtained by subjects in the Preparation stage who, by definition, were still using illicit drugs. The results suggest that these patients viewed themselves as working to maintain some change other than abstinence from illicit drugs. Possibly, these individuals had managed to reduce their drug use since entering treatment, and they wished to sustain these reductions. Possibly, too, some had discontinued use of one class of drugs but had no desire to discontinue all drug use.

The other noteworthy finding with respect to the continuous measure of stages of change was its lack of convergence with the algorithm measure of stages of change. The algorithm asks subjects about actual behavior and about intentions to change behavior in the future. Most of the URICA items, in contrast, address "worries," "hopes," "wishes," and "thoughts" regarding the problem and treatment. This is less true of the Action items which while, not very specific, do address behavior more directly, assessing the extent to which the subject believes that he or she is "working" on the problem. The other scales may assess something more akin to attitudes toward behavior change. The Prochaska and DiClemente model postulates a degree of convergence among attitudes, intentions, and behavior in the concept of a stage of change. However, many empirical studies in a variety of areas have demonstrated rather weak relationships among these three constructs (see Fishbein & Ajzen, 1975 for review). Attitudes and behavior, in particular, often evidence little measurable relation

to each other, particularly when the attitudes assessed are not tailored very specifically to the behavior in question. Thus, an individual may acknowledge a drug problem and wish for treatment, but this does not necessarily mean that he or she plans to quit using illicit drugs in the near future. More generally, the study suggests that for this population, wishes, hopes, and worries about illicit drug use and treatment do not translate directly into intentions or behavior. In this study only the Action scale evidenced a significant negative correlation with reports of recent drug using behavior.

Since the convergence of the stage algorithm and URICA has not been assessed in previous studies, it may be that the two measures do not assess the same phenomena in any population. However, it may also be that either the problem of drug addiction or the treatment provided in methadone clinics complicates the relationship between attitudes and intentions in a way that other forms of treatment do not. In other contexts, an individual who recognizes no problem with his or her behavior and who has no plans to change is unlikely also to be positively disposed to the idea of treatment. In contrast, some opiate addicts may greatly value methadone itself, though they may have no desire to discontinue illicit drug use. For such individuals, high scores on Contemplation, and Maintenance scales in particular may indicate a positive attitude toward treatment or satisfaction with past progress though their stated intentions would place them in the earliest stages of change. Similarly, some patients in the Maintenance stage, constrained by their physical dependence from leaving treatment, may express resentment toward methadone and treatment in general, even as they successfully maintain abstinence from illicit drugs.

PROCESSES OF CHANGE

Confirmatory factor analytic procedures provided some degree of support for the validity of the Processes of Change Questionnaire for use with methadone maintenance patients. The results of the study suggest that this population does not discriminate among all twelve hypothesized processes of change, however reduction of the number of scales in a manner consistent with theory suggested that four different types of change-related activities could be identified. Reevaluation involves becoming aware of the impact of the problem on oneself and others. Self Liberation is the act of making a conscious commitment to not using drugs. Reinforcing Relationships involves availing oneself of relationships with others who support the effort to change. Behavioral Processes include avoiding people and places associated with drug use as well as engaging in alternative activities.

Rosenbloom (1991) found that cocaine addicts also failed to discriminate among all of the hypothesized processes of change. She also found only four processes though they represented slightly different combinations of scales than those which emerged with this sample. She suggests that her finding may have been due to impairments in "higher cognitive functions" secondary to chronic drug use among her subjects. In the present study, such a conclusion is contradicted by the fact that subjects successfully discriminated among nine different coping scales.

It would appear instead that the theoretical distinctions among related processes may not be meaningful to patients in methadone maintenance treatment. Specifically, the Medication process probably should have been conceived as two separate processes, one involving the use of methadone and approved medications and the other involving the use of illicit drugs and alcohol. Social Liberation may simply not have great

relevance for methadone maintenance patients. Prochaska et al. (1992) define this process as "increasing alternatives for nonproblem behaviors available in society" (p. 37). Since use of illicit drugs is generally considered socially unacceptable (more so say than smoking or eating) there may be little need to increase alternatives for nonproblem behavior. For example, since heroin use is illegal, there is no equivalent to advocating for "no smoking" areas. The remaining twelve processes were represented by at least one or two items though the subjects did not distinguish among all of the hypothesized factors.

In the present study, subjects in different stages of change differed in the reported frequency with which they used the various processes of change and these differences were generally consistent with the predictions of Prochaska and DiClemente's model. It must be noted, however, that the four Processes of Change scales were the result of significant respecification of the original twelve factor model. Two entire scales (Social Liberation and Medication) and many weakly loading items were eliminated while items from related scales were combined to form the final four scales. The fact that the scales evidenced predictable relationships with other measures certainly supports their validity, but to insure against the influence of chance in the construction of the scales, the four-factor structure of the measure would have to be confirmed with a different sample.

All four of the processes of change subscales evidenced relationships with self-reported drug use which were consistent with the predictions of the Prochaska et al. model. Subjects who reported less drug use in the past 30 days reported more frequent use of Self Liberation, Reinforcing Relationships, and Behavioral Processes. This suggests that those subjects who were the most able to abstain from illicit drugs were

those who made conscious commitments to stop using drugs (Self Liberation), who availed themselves of relationships with others who supported abstinence (Reinforcing Relationships), and who found alternatives to drug using behaviors while avoiding people and situations which were likely to trigger urges to use drugs (Behavioral Processes). Behavioral Processes accounted for about 7% of the variance in reported drug use and washed out the associations between the other two process scales and drug use. It may be that Self Liberation and Reinforcing Relationships facilitate the use of the Behavioral Processes which have the most direct impact on drug use. Reevaluation, on the other hand, actually evidenced a positive association with past drug use after controlling for Behavioral Processes scores. Those patients reported more drug use who indicated that they engaged in Reevaluation without taking behavioral steps to address their drug problems.

COPE

Confirmatory factor analytic procedures provided evidence for the validity of nine of the fourteen COPE subscales for use with methadone maintenance patients. Subjects were apparently more able to discriminate among the various coping strategies than they were among the processes of change. Although the measure required some respecification to provide an adequate fit with the data, the changes required were unlikely to capitalize on chance relationships among the responses of subjects in this particular sample since the nine scales were not altered in any way and no weakly loading items were dropped.

It is perhaps not surprising that this measure weathered the confirmatory procedures with fewer alterations than the stage and process measures. Measures of coping strategies have been in use for a longer period of time and have undergone many

refinements over the years. Also, unlike the continuous stage and process measures, the COPE makes no reference to a specific problem or to treatment, and therefore required no alteration before it could be administered to methadone maintenance patients.

"Coping strategies" provide a slightly different way of conceptualizing behaviors and thought processes which might be relevant to the problem of drug addiction. As it is generally conceived, the aim of "coping" is to contend with difficulties originating outside oneself rather than to change a problematic behavior pattern. The COPE measure asks subjects how they typically deal with stress as opposed to how they deal with drug addiction. Although coping strategies and the "transtheoretical" model are not entirely independent concepts, one can conceive of important points of divergence. For example, an individual who is in other respects prepared for change but who lacks adaptive coping abilities is likely to fair poorly in the process of recovery, particularly if coping deficits are not addressed in treatment. There is some debate about the stability of coping strategies over time and across situations. The measure used in this study was designed to assess dispositional coping styles; the relationship which emerged between coping strategies and ethnic background (a very static variable) argues that coping strategies may indeed be rather stable attributes in this population.

The coping strategies evidenced an interesting relationship with subjects' ethnic background. Whites reported less frequent use than blacks of several of the more adaptive coping strategies though there were no ethnic differences in the use of alcohol and drugs as a means of coping. These results are consistent with previous studies which have suggested that white heroin addicts evidence more psychopathology than non-white addicts (Kosten & Rounsaville, 1986; Penk, Robinowitz, Roberts, Dolan, &

Atkins, 1981; Sutker, Archer, & Allain, 1978). It has been hypothesized that such findings are connected with the relative availability of heroin and prevalence of heroin use among different groups (Kosten & Rounsaville, 1986). Members of minority groups are more likely than whites to live in poorer inner city areas where heroin use is more prevalent. In such environments, heroin use may reflect less deviance from the norm than it would outside such contexts.

The confirmed coping scales evidenced a stronger relationship to reported drug use than either of the continuous stage and process measures, though this was largely due to the influence of the Alcohol/Drug Use coping scale. The results suggest that those patients who acknowledge drug or alcohol use as a means of coping are likely to be using more drugs than other patients. The strength of this association overshadowed the relationships between reported drug use and all other coping strategies except Focusing on and Venting Emotions. The negative association between this scale and drug use remained even after accounting for the relationship between recent drug use and the Drug/Alcohol Use coping strategy. Carver, et al. (1989) suggest that this strategy may be maladaptive. The finding in this study may indicate simply that those patients who use fewer drugs are more aware of their emotional states. On the other hand, if effective treatment depends in part on some awareness of one's emotional experience, it may be that use of this strategy contributes to patients' ability to benefit from counseling.

Consistent with the results of studies on alcoholism (e.g. O'Leary, et al., 1977) this study revealed no significant relationship between the reported use of denial as a coping strategy and reported combined drug use over the 30-day pretest period. The results did reveal a small but significant correlation ($r^2 = .03$) between the Denial scale

and reported cocaine use. The meaning of this finding remains unclear, but perhaps there is something about the pharmacologic properties of cocaine that make it particularly appealing to addicts who are inclined to deal with stressful circumstances by denying their existence.

The relationships between the coping scales and the algorithm stage measure suggest that there may be important stage-related differences in methadone patients' ability to cope with stress. In general, those in the earlier stages were characterized by more frequent reported use of maladaptive strategies (Alcohol/Drug Use and Behavioral Disengagement) than of adaptive ones (Planning and Seeking Social Support for Emotional Reasons). Conversely, those in the Action and Maintenance stages were characterized by more frequent reported use of the adaptive strategies and less frequent use of the maladaptive ones. The results suggest that in the face of stress, Precontemplators may be likely to simply give up and use drugs. To the extent that the coping strategies represent stable attributes, the distinctive maladaptive coping scale profile produced by Precontemplators in this study suggests that this stage may be rather static for methadone maintenance patients.

The COPE scale findings suggest that effective treatment may need to incorporate interventions aimed at remediating deficits in coping abilities. Such remediation could take at least two different forms depending upon one's theoretical orientation. According to one formulation, addicts continue using drugs largely because they lack the ability to conceptualize the step-by-step means of achieving satisfying goals. This formulation suggests a treatment approach which involves teaching addicts cognitive interpersonal problem solving skills (see for example Monti, Abrams, Binkoff, & Zwick, 1986; or Platt, Morell, Flaherty, & Metzger, 1982). The

"transtheoretical" model would suggest that this type of intervention might be effective with addicts who are already prepared to take action to address their problems.

Psychoanalytic theorists view heroin addiction as the result of more profound deficits incurred at a very early age and ingrained in character. From this perspective, the findings of this study may reflect stage differences in unconsciously motivated defensive styles or ego deficits. For example Khantzian, Mack, and Schatzberg (1974) describe heroin addicts as typically lacking in "self-preservation functions" and manifesting a "specific ego impairment having to do with self-care and self-regulation" (p.163). Khantzian et al. advocate a treatment approach which focuses on exploring with the patient "the ways in which he has used drugs to avoid life's inevitable pain and vicissitudes" and then teaching alternative ways to cope with disappointment and distress (p. 164). To the extent that such an approach raises awareness of the problem and its relation to oneself, the stage formulation suggests that it might be more effective with Precontemplators.

CHARACTERISTICS ASSOCIATED WITH DIFFERENT STAGES OF CHANGE

In general, subjects classified into adjacent stages of change did not differ significantly from each other on most of the stage, process, and coping measures. However a pattern of significant differences and trends emerged in the profiles of scores associated with the stages - a pattern which supports the efficacy of the Stages of Change Algorithm as a means of classifying methadone maintenance patients into five relatively distinct groups.

The results suggest many similarities between subjects in the Action and Maintenance stages, although, of the two groups, Maintenance subjects more clearly distinguished themselves from those in the first three stages. Their URICA scores indicate that both groups see themselves as taking action to address their drug problems, though Maintenance subjects may not be especially optimistic about the value of continued treatment. They were the only subjects besides Precontemplators to obtain higher average scores on the Precontemplation scale than on the Contemplation scale. Neither subjects in the Action nor the Maintenance stages obtained particularly high scores on the Maintenance scale. Rather than seeing themselves as actively working to maintain significant changes in drug using these patients may attribute their relative success to the methadone itself. At the same time they may recognize their continuing dependence on methadone as evidence that their drug problems are not yet resolved in the way that the Maintenance scale items suggest.

On the Processes of Change scale, both Action and Maintenance subjects obtained relatively high scores on Behavioral Processes, Reinforcing Relationships, and Self Liberation. Their responses indicate that, more than those in the earlier stages, these patients affirm to themselves their commitment not to use drugs. They see themselves as actively working to avoid stimuli associated with drug use and to find alternatives to drug use. They also seem to make more use of relationships with others who support their abstinence.

Though by definition, patients in the Preparation stage were still using drugs, they distinguished themselves from other current drug users by their high scores on the URICA Contemplation and Action scales and on the Self Liberation and Behavioral Processes scales of the Processes of Change measure. This pattern of scores suggests

that patients in this stage experience a desire for help and a sense of hopefulness regarding their treatment; they perceive themselves as taking action to address their drug problems; they make commitments to change; and they are taking behavioral steps to avoid drug use. The relatively short treatment tenure associated with this stage suggests that most patients pass through it relatively early in their treatment. Many Prepared subjects reported that they had been in treatment for six months or less and almost two thirds reported treatment tenures of less than two years. The results suggest that it may be important to facilitate behavior change early in treatment to capitalize on this apparent window of opportunity.

Subjects in the Preparation stage also achieved higher scores than other groups on the URICA Maintenance scale. Although the differences did not achieve statistical significance, the elevated scores suggest that subjects in this stage endorsed items which frame the problem of illicit drug use as "resolved" and "already changed." These scores point to a potential obstacle in the treatment of Prepared patients, hinting that many may view their drug problems as behind them despite the fact that they continue to use illicit drugs.

Subjects in the Contemplation and Precontemplation stages indicated by their responses to the measures that they were not particularly interested in treatment and that they were doing little to change their drug using behavior, although Precontemplators were more extreme in these respects than Contemplators. Both groups obtained their highest URICA scores on the Precontemplation and Contemplation scales. The near equality of these two scores for the algorithm Contemplators suggests that more patients in this stage may at least be considering the possibility that they have a problem with which treatment can help them.

Regarding the Processes of Change scale, the results suggest that subjects in the Precontemplation and Contemplation stages make relatively little use of all of the processes, but more than anything else, they may be reevaluating their drug problem. The results suggest that Precontemplators and Contemplators may be as aware as other patients of the negative consequences of their drug problems; it remains for a longitudinal study to determine whether greater awareness of these negative consequences spurs these patients into the next stage.

Alternatively, it may be that what distinguishes Precontemplators and Contemplators from other addicts in treatment is that they do not recognize the potential benefits of discontinuing illicit drug use or that these are outweighed by the potential costs of discontinuing drug use. For example, patients whose drug use serves to help ward off intolerable feelings may be well aware of the disadvantages of continued drug use. However, these may be balanced by the pain associated with discontinued drug use. Such patients might benefit from interventions aimed at providing the support and the means for dealing with painful feelings in other ways. Alternatively, some individuals in the early stages may feel hopeless in the face of their problems and may view themselves as unable to effect change. Such individuals might benefit most from interventions aimed at increasing self-efficacy.

One way in which Precontemplators clearly distinguished themselves from Contemplators was in the amount of time they reported being in treatment at their current clinics. Precontemplators reported significantly longer treatment tenures than patients in any other stage except Maintenance, averaging six years at their current clinics and accounting for 35% of all subjects who had been in treatment for over five years. The finding raises serious questions about the efficacy of long term methadone maintenance.

With the increasing risk of AIDS transmission and research findings suggesting that duration of treatment is positively associated with decreased drug use, there has been a growing consensus that treatment retention should be a major goal of methadone treatment programs (e.g. Hubbard, et al., 1989; Simpson, 1979). While it is certainly possible that most patients do benefit in other ways from long-term methadone maintenance, the results of this study suggest that for many patients, retention, by itself, may have little effect on chronic illicit drug use.

GENERALIZABILITY

This study's primary purpose was to validate and refine measures for use with methadone maintenance patients. The volunteer sample recruited for this study should have served adequately for this purpose. Indeed most of the published work with the stage and process measures has relied upon volunteer rather than random samples. This particular sample represented some diversity in treatment settings (four different methadone maintenance clinics) and a wide range of patient characteristics.

Though there were reasonable numbers of subjects in each of the employment categories, the sample may have over-represented disabled patients and under-represented patients with full-time jobs. Given the association between employment characteristics and stages, it is possible that the sample contained a greater proportion of Precontemplators and smaller proportions of patients in the Action and Maintenance stages than the clinic populations. However, comparison of the sample characteristics with demographic data from each of the clinics revealed no significant differences in any other area. These findings argue against the possibility of other selection biases introduced by relying upon patient volunteers. Nonetheless, a future study might

incorporate some special effort to recruit those patients who have full-time jobs and are therefore less likely to be willing to take the time to participate.

The cross-clinic generalizability of the present findings is limited by the well-documented variability across clinics in policies, quality of service, and rates of continuing drug use (Ball, Lange, Myers, & Friedman, 1988; General Accounting Office, 1990). For example, more successful clinics would be expected to have relatively smaller percentages of clients in all of the first three stages of change. In addition, some clinics have policies which dictate that chronic illicit drug users must be administratively discharged after a specified time period. Precontemplators at clinics with such policies would necessarily have treatment tenures shorter than the six-year average in this study. These limitations are inherent in this kind of research and do not detract from the treatment implications of the present study.

STUDY 2: FOLLOW-UP

METHOD

SUBJECTS

The sample for this study consisted of the 44 subjects recruited from Clinic 1 in Study 1 above. The recruitment procedures for this study were similar to those used in Study 1. All subjects were opiate-addicted methadone maintenance patients engaged in treatment at the time of their participation in the study. Inclusion and exclusion criteria were the same as for Study 1. As mentioned above, data from two subjects were discarded. One subject's data were judged invalid due to apparent carelessness or illiteracy. The other subject obtained URICA scores approximately three standard deviations away from the mean on all four subscales. The remaining 42 subjects provided all of the data for this study. The demographic characteristics of the sample are given in Appendix A. They include the outlying subject because her data were used in the confirmatory factor analytic procedures in Study 1.

To provide an indication of the generalizability of the results, the demographic characteristics of the Clinic 1 subjects were compared with the demographic characteristics of subjects from the other three clinics. These analyses indicated that, on average, the Clinic 1 sample was approximately four years younger than the rest of the sample (35.8 years vs. 40.0 years) and had spent less than half as much time in treatment at their current clinic (17.8 months vs. 51.3 months). The Clinic 1 sample also had a greater than expected proportion of white subjects and a smaller than expected proportion of black subjects compared with subjects from the other clinics. However, the two samples did not differ significantly on any of the other demographic

variables nor on any of the self-reported drug use variables. (See Appendix Q for the details of these analyses.)

MEASURES

Questionnaires

This study utilized the same questionnaire measures used in Study 1 and described above. The scales and items used for analyses were determined by the Study 1 confirmatory procedures. For the URICA, only 16 items were used, 4 for each of the four scales (Appendix L). With respect to the Processes of Change questionnaire, analyses were limited to four scales comprised of a total of 25 items (Appendix N). For the COPE, the nine confirmed four-item scales provided data for analyses in this study (Appendix P).

Urine Screens

All subjects provided urine specimens at least once per week. These specimens were screened on site using EMIT® technology for the following substances: opioids, methadone, cocaine, benzodiazepines, THC (marijuana, hashish), amphetamines, barbiturates, and propoxyphene .

PROCEDURE

Data collection procedures for this study differed only slightly from the procedures described above for Study 1. Since follow-up data were to be collected, the questionnaires could not be anonymous. However, in order to promote forthright responding and to maintain consistency with data collection procedures at other clinics, subjects were assured that their responses would be kept confidential from all

clinical staff and would not affect their treatment. The questionnaires were administered by research assistants who used unique numbers to identify the materials completed by each subject. Only the research assistants knew which numbers were associated with which patients. All subjects completed informed consent forms (see Appendix J). In order to assure broad participation, administration of the measures was not limited to a single day as it was at the other clinics. Instead, subjects continued to be recruited over a two-month period. The measures were administered to subjects either individually or in groups of up to ten at a time, depending on how many subjects showed up at a given administration time. All questionnaires were completed on site and in the presence research assistants to insure against incomplete or random responding. As mentioned in Study 1, the average time required to complete the questionnaires was approximately 45 minutes and subjects were paid $10.00 for their participation.

Urine specimens were collected from each subject over a three-month posttest period, though no additional specimens were collected for this study beyond those routinely collected at the clinic as a part of treatment. Clients provided these specimens in the morning prior to receiving medication. The number of urine specimens collected per week for each subject varied from one to three depending upon the particular subject's tenure in treatment and history of illicit drug use. Clinic policy dictates that those who have been in treatment longer and have evidenced abstinence from illicit drugs are required to provide fewer urine specimens than those with shorter treatment tenures (less than nine months) or who evidence chronic illicit drug use. As a matter of clinic procedure, all specimens were collected under observation by clinic staff to insure against falsified specimens.

RESULTS

For each subject, a measure of treatment progress was created by calculating the proportion of "clean" urine specimens provided over the three-month follow-up period. For each subject, the total number of urine screens which tested negative for all illicit substances was divided by the total number of urine screens provided over the three-month period. A urine screen was counted as "clean" if it was negative for all of the seven categories of illicit drugs for which urines were tested. The only exceptions were cases in which a subject was taking a medication with the approval of the medical director for a bona-fide medical condition. Three of the subjects in this sample were taking medically approved benzodiazepines. Two were being treated for anxiety disorders and the third was receiving medication for muscle spasms. Urine specimens which tested positive for benzodiazepines only were not counted as "dirty" for these subjects.

Seven subjects did not remain in treatment for some portion of the three-month follow-up period. Two of these subjects were administratively detoxified for chronic illicit drug use. A third was administratively detoxified for repeated disruptive behavior and verbal abuse of the clinic staff. Another was incarcerated on two separate occasions for a total of fourteen days. Three subjects simply stopped showing up for their daily medication. They were discharged against medical advice. Missing data for these clients were substituted by extrapolating from their previous urine screen results (see Appendix K for details). Since each of these clients was a regular user of illicit drugs at the time they left treatment, almost all of the extrapolated urine screen results were counted as "dirty."

VERACITY OF SELF-REPORTED DRUG USE

It has been relatively well established that addicts report their own drug use with a reasonable degree of accuracy (Magura, Goldsmith, Casriel, Goldstein, & Lipton, 1987; Maisto, McKay, & Connors, 1990). Nonetheless, to obtain a measure of the accuracy of self-reported drug use in this study, the drug history questionnaire data were checked against urinalysis results. The results are summarized below in Table 3.1.

Table 3.1
Veracity of self report: urine screen data vs. self-report for the period of 30 days prior to the study and for the period of 6 months prior to the study.

Drug Use - Past 30 days			Drug Use - Past 6 months		
	Questionnaire			Questionnaire	
Urinalysis	Yes	No	Urinalysis	Yes	No
Yes	25	3	Yes	35	3
No	0	15	No	0	5

The results indicate that the subjects were relatively accurate in their self reports. Comparison of the urine screen data with questionnaire data on the issue of whether a subject had used any kind of illicit drug in the past 30 days yielded a Cohen's Kappa value of .85. On the issue of whether a subject had used illicit drugs in the past 6 months, the value for Cohen's Kappa was .73. In each case, three of the 43 subjects did not acknowledge drug use in the specified period, though urinalysis records indicated that they had, in fact, used drugs. All three of the subjects who inaccurately reported no use in the past six months had remained abstinent for periods ranging from 2 to 5 months prior to the survey. For example, one of these subjects produced a single positive urine screen approximately five months prior to the

questionnaire. The three subjects who inaccurately denied drug use in the 30 day period prior to the interview had all used a variety of drugs repeatedly during the period in question.

With respect to the stages of change algorithm, the inaccuracies in self-report in this sample resulted in the incorrect classification of 6 of 43 subjects or 14% of the sample. It is likely, however, that inaccurate self-reporters would be reclassified into an adjacent category rather than a distant one. Each of the three Maintenance subjects in this sample would be reclassified in the Action stage since they had abstained from drug use for the 30 days prior to the testing. It would be impossible to reclassify the others since their answers to questions regarding their intentions to give up drug use are unknown. However, had they been questioned, it seems likely that they would have asserted their intention to give up illicit drugs in the next 30 days since they claimed that they had already done so. This would have placed them in the Preparation stage. The subjects were not reclassified for subsequent analyses, since subjects from all other clinics were classified only on the basis of self report. The discrepancies between self-report and urinalysis data simply provide a means of assessing one element of measurement error inherent in all such studies.

STAGES OF CHANGE ALGORITHM

If the stages of change have clinical significance, they should predict outcome to some degree. Table 3.2 shows mean outcome scores for subjects in each of the algorithm stages. In addition to proportion of urines negative for all illicit drugs, the table also shows outcome as measured by abstinence from the three most widely used specific classes of drugs: opiates, cocaine, and benzodiazepines. The results indicate that the algorithm stages did indeed predict outcome.

Table 3.2

Mean proportions of urine specimens negative for illicit substances submitted during the three-month follow-up period by subjects in each of the five stages of change.

Urine Screen Results	Precon-templation (n = 3)	Contem-plation (n = 7)	Preparation (n = 15)	Action (n = 10)	Main-tenance (n = 7)	F test (4, 37)	Tukey Comparisons
	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	F Signif.	p < .05
Prop. of urines neg. for all illicit drugs	.07 (.12)	.13 (.27)	.19 (.32)	.88 (.17)	.95 (.06)	23.70 p < .0001	PC,C,PA< A,M
Prop. of opiate-negative urines	.49 (.24)	.28 (.43)	.50 (.35)	.89 (.18)	.98 (.64)	7.82 p < .0001	C, PA<A, M
Prop. of cocaine-negative urines	.23 (.37)	.68 (.42)	.67 (.39)	.98 (.03)	.99 (.03)	4.96 p < .01	PC < A, M
Prop. of benzo-negative urines	.57 (.51)	.66 (.36)	.67 (.41)	.98 (.05)	.99 (.01)	2.89 p < .05	-

With respect to abstinence from all illicit drugs (proportion of urine screens negative for all illicit drugs), subjects in the Action and Maintenance categories fared significantly better in the three-month follow-up period than subjects in the first three stages. Of course this, in itself, is not especially surprising. By definition, those in the Action and Maintenance stages had maintained abstinence for at least the past 30 days and past behavior is always an excellent predictor of future behavior. In terms of the validity of the model, the more important comparisons lie among the first three stages. In fact, as the model predicts, those in the Preparation stage achieved a greater percentage of 'clean' urine specimens than those in the Contemplation stage, who, in turn, fared better than those in the Precontemplation stage. These results are illustrated graphically in Figure 3.1.

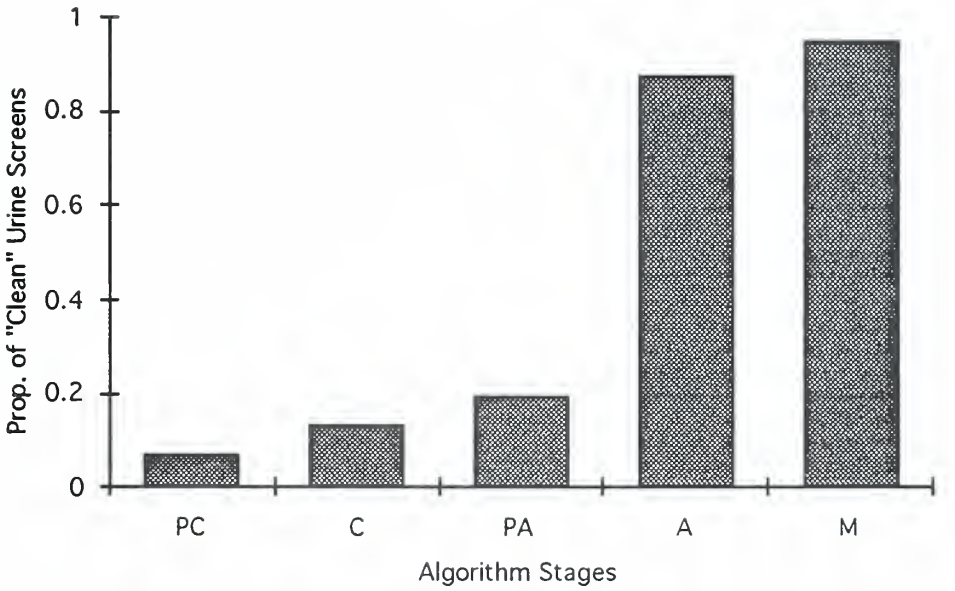

Figure 3.1. Mean proportions of "clean" urine specimens submitted during the three-month follow-up period by subjects in each of the five stages of change.

Unfortunately, with this limited sample size, these differences did not achieve statistical significance using the Tukey procedure. To increase the effective sample size, subjects in the Precontemplation and Contemplation stages were combined and compared with those in the Preparation stage. However, this T test, too, failed to reveal statistically significant differences at the $p < .05$ level. Of the 15 patients in the Preparation stage, 2 achieved a 30-day period with no "dirty" urine screens during the three-month follow-up period. None of the Precontemplators and only one of the seven Contemplators achieved a 30-day period of illicit-drug abstinence.

With respect to treatment drop-out, of those 6 subjects who discontinued treatment prior to the end of the three-month follow-up, 2 were Precontemplators, 3 were in the Preparation stage and the last was classified into the Action stage on the

basis of self report, though his urinalysis results indicated that he had used illicit drugs in the 30 days prior to completing the questionnaires. It is difficult to draw conclusions on the basis of such a small sample especially in light of the fact that these subjects left treatment for different reasons and under different circumstances. However it is noteworthy that two of the three patients in Precontemplation stage dropped out of treatment prematurely.

CONTINUOUS MEASURES - URICA AND PROCESSES OF CHANGE

To examine the relationships between outcome and the continuous stage and process measures, Pearson correlations were calculated between the proportions of urine screens negative for various illicit substances on the one hand and URICA and Processes of Change scores on the other. As the Table 3.3 illustrates, the continuous stage and process measures correlated only modestly with outcome. Restricting our attention to the primary outcome measure (proportion of urine screens negative for all illicit drugs), only one of the correlations is significant at the $p < .05$ level. The Behavioral Processes correlated positively with illicit drug abstinence over the three-month follow-up period. The correlations were negligible between the outcome measure and most of the other continuous measures, though most of them did assume the predicted directions. The scales representing the earlier stages, Precontemplation and Contemplation correlated negatively with the abstinence measure while the Action scale evidenced a positive correlation. With the exception of Reinforcing Relationships, the process measures, too, correlated in the predicted directions. In particular, the trends suggest that subjects obtaining higher scores on processes involving reevaluation of their drug problem fared more poorly than other subjects.

Table 3.3

Pearson correlations between continuous stage and process measures on the one hand and proportions of urine specimens negative for illicit substances submitted during the three-month follow-up period.

	Proportion of urines neg. for all illicit drugs	Proportion of urines neg. for opiates	Proportion of urines neg. for cocaine	Proportion of urines neg. for benzodiazepines
URICA Scales				
Precontemplation	-.08	.16	-.12	.05
Contemplation	-.26	-.25	-.30	-.14
Action	.05	.09	.14	.04
Maintenance	-.14	-.17	-.19	-.05
Process of Change Scales				
Reevaluation	-.15	-.30	-.17	-.10
Self Liberation	.08	-.10	.04	.29
Reinforcing Relationships	-.03	.02	04	.17
Behavioral Processes	.35*	21	.25	.36*

* P < .05

A stepwise multiple regression analysis in which all of the continuous stage and process measures were used to predict abstinence scores confirmed that the Behavioral Process scale was the only scale which contributed significantly to predicting the outcome measure. Scores on this scale accounted for 12% of the variance in the measure of abstinence during follow-up. By comparison, past behavior, as measured by percentage of 'clean' urines in the 30 day pretest period accounted for approximately 84% of the variance in outcome. None of the stage or process continuous measures contributed significantly to prediction after this measure was entered into the regression equation.

COPE SCALES

As mentioned earlier, the COPE scales were administered primarily for purposes of comparison. The idea was to compare the predictive efficacy of the stage and process measures with a more traditional self-report measure of activities believed to be relevant to drug use and to treatment outcome. To assess the relationships between outcome and coping strategies, Pearson correlations were calculated between COPE scale scores and the proportions of urine specimens which tested negative for various illicit substances. These are listed in Table 3.4 below.

Table 3.4
Pearson correlations between COPE scales and proportions of urine specimens negative for illicit substances submitted during the three-month follow-up period.

COPE Scales	Proportion of urines neg. for all illicit drugs	Proportion of urines neg. for opiates	Proportion of urines neg. for cocaine	Proportion of urines neg.. for benzodiazepines
Planning	.22	.06	.04	.02
Seeking Social Support for Emotional Reasons	-.04	.12	.05	.24
Seeking Social Support for Instrumental Reasons	.01	-.05	.12	-.11
Suppression of Competing Activities	-.13	-.09	-.12	-.18
Religion	-.43**	-.15	-.43**	-.27
Focus on and Venting of Emotions	.02	-.06	-.08	.00
Behavioral Disengagement	-.24	-.17	-.29	-.32*
Denial	-.40**	-.15	-.38*	-.14
Alcohol/Drug Use	-.56**	-.44**	-.58**	-.49**

* $p < .05$ ** $p < .01$

As the table illustrates, several of the coping scales produced significant correlations with the outcome variables. Not surprisingly, endorsement of alcohol and drug use as a frequent coping strategy was negatively associated with illicit drug abstinence during the follow-up period. Unexpectedly, the Religion and Denial scales also produced significant negative correlations with posttest abstinence, accounting for 18% and 16% of the variance (respectively) in the primary outcome measure. Subjects who endorsed these coping strategies at a higher level fared more poorly during the three-month follow-up period. A series of multiple regression analyses indicated that after Alcohol and Drug use was entered into the equation, Religion was the only other scale which contributed significantly to predicting outcome. Together, these two variables accounted for 38% of the variance in the outcome measure.

Dependent variable = proportion of "clean" urine specimens

COPE Scale	Beta	T	Significance
Alcohol/Drug Use	-.49	-3.83	$p < .001$
Religion	-.32	-2.51	$p < .05$

Adjusted R Square = .38

Study 1 demonstrated a relationship between the Religion coping scale and ethnic background. Ethnic background, itself, has been shown to predict drug treatment outcome in some studies (Rounsaville, et al., 1982; Stephens & Cottrell, 1972). Specifically, non-white patients have achieved poorer outcomes than whites. Therefore it was important to determine whether the relationship between Religion and outcome in this study was primarily an artifact of a relationship between Religion and ethnic background. Ethnic background was entered into the regression equation as two dichotomous dummy variables representing the three primary ethnic categories in this sample, white, black, and Hispanic. The results indicated that Hispanic ethnic

background was associated with poorer outcome, however, the Religion coping scale continued to be a significant predictor of illicit drug use during follow-up.

Dependent variable = proportion of "clean" urine specimens

COPE scale	Beta	T	Significance
Alcohol/Drug Use	-.53	-4.37	$p < .001$
Hispanic ethnic background	-.29	-2.45	$p < .05$
Religion	-.27	-2.20	$p < .05$

Adjusted R Square = .45

Additional regression analyses were conducted to determine whether the coping measures contributed to predicting outcome after taking past drug-using behavior into account. When the percentage of "clean" urines in the 30 day pretest period was entered into the equation, only the Religion scale remained a significant predictor of outcome, accounting for an additional 2% of the variance in the proportion of "clean" urines specimens submitted during follow-up.

Dependent variable = proportion of "clean" urine specimens

COPE scale	Beta	T	Significance
Prop. of "clean" urines - past 30 days.	.86	13.85	$p < .0001$
Religion	-.17	-2.76	$p < .01$

Adjusted R Square = .86

DISCUSSION

Though the sample was limited in size and in the extent to which it represented the five stages, the results provide a degree of support for the predictive efficacy of the "transtheoretical" model though not for the URICA. Of all of the stage and process measures, only the Behavioral Processes scale and the stage algorithm contributed significantly to predicting outcome as measured by "clean" urine specimens. The

results indicate that patients in the Action and Maintenance stages fare better in treatment than patients in the earlier stages of change, reflecting the fact that past behavior predicts future behavior. By definition, those in the Action and Maintenance stages were the only patients who maintained 30 days of abstinence from illicit drugs prior to administration of the measures; they were also the patients most likely to maintain abstinence afterwards. In this study, past behavior as measured by the proportion of "clean" urine specimens submitted over the 30-day pretest period accounted for fully 84% of the variance in outcome leaving very little to be predicted by anything else. This figure speaks to the refractory nature of the problem, though it also suggests that those patients who do manage to achieve illicit-drug abstinence for at least 30 days are likely to maintain it.

For those subjects who were still using drugs at the time they completed the measures, the trends in treatment progress were in the predicted directions. Prepared subjects achieved a greater proportion of "clean" urine specimens than subjects in the Contemplation stage who, in turn fared better than Precontemplators. Prepared subjects achieved a proportion or "clean" urine specimens over twice as great as subjects in the Precontemplation stage. With only twenty-five subjects in the first three categories, these differences failed to achieve statistical significance. However, relationships between outcome and two other measures lend support to the idea that Precontemplation predicts poorer outcome. Reported use of drugs and alcohol as a coping strategy predicted more drug use during follow-up, accounting for 30% of the variance in outcome. Reported use of Behavioral Processes of change was associated with less drug use, accounting for 12% of the variance. Study 1 demonstrated that the Precontemplation stage is characterized by the most frequent use of alcohol and drugs as a coping strategy and by least frequent use of Behavioral Processes of change. This

combination of findings suggests that patients in the Precontemplation stage (as measured by the algorithm) are the least likely to achieve positive outcomes.

This is not to say that patients in the Preparation stage are likely to achieve illicit-drug abstinence in a short period of time. Though by definition, patients in this stage planned to quit using illicit drugs in the next 30 days, on average, Prepared subjects continued to submit over 80% "dirty" urine specimens during the three-month follow-up period. Only two out of fifteen managed to achieve a 30-day period of illicit-drug abstinence during follow-up. Although this record is better than that of Precontemplators and Contemplators, it appears that for many patients the professed intention to change their behavior may have relatively little influence on outcome.

The scales of the URICA bore no significant relationship to drug use during follow-up. Not even the Action scale correlated with outcome, despite the fact that this scale did evidence a significant negative correlation with self reported drug use in Study 1. The Contemplation and Maintenance scales demonstrated the largest correlations with positive outcome though both correlations were negative. The model predicts that high scores on the Contemplation scale should be associated with poorer outcome since Contemplators have not yet decided to give up drug use. However the negative association between the Maintenance scale and outcome conflicts with the model's predictions and again points to the rather unusual pattern of responses to the Maintenance items in this investigation. Consistent with the Study 1 results, the trends in the Study 2 data suggest that high scores on the Maintenance items are associated with greater amounts of drug use. The results suggest that these items may be assessing complacency as much as anything else.

Three of the four process scales also failed to predict outcome despite the fact that two of them (Self Liberation and Reinforcing Relationships) evidenced significant correlations with reported recent drug use in Study 1. Only the Behavioral Processes scale significantly predicted outcome, indicating that those patients do best who avoid stimuli associated with drug use and who find other things to do besides using drugs. Possibly, a larger sample which better represented the early stages of change might have produced significant correlations with other processes of change. It is also possible that the processes of Self Liberation and Reinforcing Relationships exert an influence on outcome indirectly by facilitating the use of the Behavioral Processes as suggested in the Study 1 discussion. It makes sense that those patients who make commitments to change and who utilize supportive relationships (especially the counseling relationship) would also be the most likely to implement behavioral strategies to avoid illicit drug use.

Consistent with the Study 1 results, the coping measures demonstrated greater predictive efficacy than the continuous stage and process measures. The Alcohol/Drug Use scale, in particular, significantly predicted outcome. Those patients who acknowledge the use of alcohol and drugs as a frequently used coping strategy are the most likely to continue using drugs. The relationships between coping scales and outcome again point to the clinical reality that many methadone patients need help not only in changing their drug using behavior but in changing the way they cope with other stresses in their lives as well.

It must be noted however that the relationship between outcome and the Alcohol/Drug Use scale disappeared after controlling for past drug-using behavior. In other words, for patients with similar 30-day histories of illicit drug use, differences

in Alcohol/Drug Use coping scores do not predict differences in outcome. It is possible that high scores on this scale simply reflect a high degree of recent drug use. Patients may infer from their recent behavior that they use drugs to cope with stress, and therefore endorse those items. However, it may be their drug use that is the most important predictor rather than their self-reported coping style.

Unexpectedly, both the Religion and Denial scales of the coping measure predicted higher levels of illicit drug use during the follow-up period. Consistent with the Study 1 results, the Denial scale exhibited the strongest correlation with cocaine use. The results of both studies suggest that the relationship between cocaine use and denial warrants further investigation. From a clinical perspective the relationships between drug use and both religion and denial make sense. One would predict poorer outcome for patients who deny the existence of stressors or who turn their problems over to God as opposed to addressing them directly. The latter finding may have relevance for twelve-step recovery programs which prescribe a degree of reliance on a "higher power." For methadone maintenance patients, such reliance may contribute to continued drug use. However, neither the Religion nor the Denial scales demonstrated significant relationships with self-reported combined drug use in the larger Study 1 sample. Both findings should be replicated before firm conclusions can be drawn.

The findings of this study suggest that the "transtheoretical" model may have less predictive efficacy with respect to the problem of continuing illicit drug use among methadone maintenance patients than to some of the other problems to which the model has been applied. The Study 1 discussion touched on some of the ways in which methadone treatment itself complicates the relationship between attitudes and intentions. It is also likely that some of the differences between previous findings and

the results of these studies derive from the complexities of opiate and polydrug dependence. The measures were developed largely through research regarding the problem of smoking. Although nicotine is highly addictive, it may not be comparable to heroin when it comes to the kind of drastic change involved in quitting. Some have argued that heroin addiction shapes the very personalities of addicts, removing the need for other sources of gratification and leading to a kind of atrophy of other coping mechanisms. Khantzian et al. (1974) suggest that heroin addicts do not establish "familiar defensive, neurotic, characterological, or other common adaptive mechanisms as a way of dealing with their distress... because the psychophysiologic action of the drug attenuates and subdues feelings and emotions that would ordinarily be resolved... through symptom formation or other adaptive mechanisms" (p. 162). One of the Study 3 subjects echoed these sentiments, describing heroin as "a substitute for everything - pleasure, people, things... It's all-encompassing."

Significant demographic differences between this sample and the larger sample suggest that caution should be exercised in generalizing the findings of this study. A larger and more representative sample would have provided a better test of the predictive efficacy of the measures. Subjects in the Clinic 1 sample were younger and had spent less time in treatment than subjects in the larger sample. In addition, only three subjects fell into the Precontemplation stage. These subjects were not typical of the Precontemplators in the larger sample who tended to have longer treatment tenures and, therefore, possibly, more entrenched negative attitudes about the prospect of changing their behavior. It is conceivable that these differences limited the variation in stage and process scale scores thus weakening their relationship with outcome. However, since most of the correlations between outcome and the stage and process

measures did not even approach statistical significance, it seems unlikely that a more representative sample would have yielded drastically different results.

STUDY 3: INTERVIEWS OF SELECTED SUBJECTS

METHOD

SUBJECTS

The Study 3 sample consisted of 14 subjects recruited from among those who had participated in Study 2. All subjects who participated in Study 2 were eligible to participate in Study 3, though volunteers were accepted on a first-come first-served basis as described below. The original plan called for the recruitment of 3 subjects from each of the five stages of change as determined by the algorithm. However, several complications arose resulting in unequal representation of the five stages. Only one of the three Clinic 1 Precontemplators agreed to participate in Study 3. Due to a clerical error, 4 subjects from the Contemplation stage were interviewed instead of 3. In addition, 2 of the 14 participants had been misclassified on the basis of their self-reported drug use. Therefore one of the subjects who was supposed to represent the Action stage really belonged in the Preparation Stage while one of the three supposed Maintainers actually belonged in the Action stage. As a result of these problems, the sample consisted of 1 subject from the Precontemplation stage, 4 subjects from the Contemplation stage, 4 subjects from the Preparation stage, 3 subjects from the Action stage, and 2 subjects from the Maintenance stage.

PROCEDURE

All subjects who participated in Study 2 received letters inviting them to participate in the interviews which comprised Study 3. The letters informed potential subjects that if they chose to participate, they would need to agree to disclose their

Study 2 responses to the author who also serves as clinical director at Clinic 1. Subjects were assured that neither their responses to the Study 2 questionnaires nor to the interview questions would in any way affect their treatment. Subjects were interviewed on a first-come, first-served basis. Research assistants, who were aware of subjects' algorithm stage attempted to assure that no more than 3 subjects from each category were interviewed. After the third subject from a given category participated, the research assistants canceled any scheduled interviews with additional subjects in the same stage. All subjects completed informed consent forms prior to beginning the interview (see Appendix Q). The interviews lasted for approximately 75 minutes each. Subjects were paid $15 for their participation.

Subjects were interviewed about their social and family histories, their treatment goals, the means by which they hoped to achieve those goals, and any obstacles which they believed might impede their progress. The interviews followed the same semi-structured format for all subjects (see Appendix R). In addition to these basic questions, follow-up questions were posed at the author's discretion and tailored to individual subjects' responses. Detailed notes were made during the interviews and used in conjunction with any previous knowledge of the subjects to compile clinical profiles of individuals in each of the five stages. Since statistical analyses of the Study 2 data had not yet been completed, subjects' scores on the stage and process measures were not known to the interviewer at the time of the interviews. The interviews were completed between three and eight weeks after completion of the questionnaire measures.

The interview data were examined for clues regarding the following questions. To what extent do the stage and process measures correspond with subject's clinical

presentations? What accounts for the divergence between the two stage measures? What factors may contribute to the weakness of the relationships between scores on the measures and outcome as measured by urine screen data?

RESULTS & DISCUSSION

The interviews provide a few detailed illustrations of the application to specific individuals of the notions of stages and processes of change. Although the sample is too small to serve as a basis for drawing broad conclusions, the interviews do provide a means for beginning to understand some of the strengths and limitations of the Prochaska and DiClemente model as it can be applied to methadone maintenance patients. The interviews point to common features among subjects within stages and illustrate ways in which clinical realities sometimes contradict the model's predictions. Perhaps more than anything, the interviews offer a glimpse at the depth and complexity of the problems which confront patients and treatment providers in a methadone maintenance clinic.

The interviews illustrate several factors which may have weakened the relationships among the two stage measures and compromised the predictive efficacy of the model. The data support the hypothesis that some patients in the earlier stages do not have as their goal abstinence from all illicit drugs, though many may perceive the need for treatment and see themselves as having made significant changes. At least one subject indicated that when she entered treatment, she wanted to discontinue opiate use only. Other subjects implied that they were primarily interested in reducing their illicit drug use rather than stopping it altogether. The interview subjects also provided examples of movement between stages. Several seemed to have graduated or regressed a stage between completion of the measures and the time of the interviews. The model

allows for such movement, but it would be expected to weaken the relationship between initial stage classification and outcome. For example, although initial classification in the Precontemplation stage predicts poor outcome, a Precontemplator who manages to graduate to the Preparation stage might be expected to show improvement during follow-up.

The interview subjects also evidenced commonalties within different stages. Although they did not appear to be doing much contemplating, the Contemplators did seem undecided about attempting further change. The Prepared subjects did in fact seem to be more committed to changing their behavior than subjects in earlier stages and most were taking steps in that direction though with limited success. Subjects in the Action stage evidenced interesting similarities in the extent to which they were influenced by relationships with their spouses. Neither the Maintainers nor the Precontemplators who participated in the interviews were particularly representative of the larger sample of patients in these stages; however their responses pointed to possible reasons for differences between the findings of the present study and those reported by Prochaska, DiClemente and colleagues.

The following discussion will focus on both the common and distinctive features of interview subjects within algorithm stage classifications. Subjects' specific Processes of Change and URICA scores will be reported when relevant but will not be examined systematically, since these analyses were reported earlier. The discussion will conclude with an examination of some of the common features of the interviews - features which seem to cut across stage categories and underline distinctions between methadone maintenance patients and other addicted populations.

PRECONTEMPLATION

The single Precontemplator who participated in the interview was not representative of patients in this stage of change, though his interview does provide an example of the manner in which the two different stage measures can diverge. Unlike the majority of Precontemplators in the large sample who had been in treatment for years, this subject had been in treatment for only 18 days prior completing the Study 2 questionnaires. He also reported a relatively short history of heroin use, beginning only two years prior to the study. He stated that he began using heroin immediately after he learned that he had contracted AIDS. Clinic records indicate that in addition to heroin, he was using benzodiazepines, amphetamines, and cocaine. Although he indicated on the algorithm that he did not plan to discontinue illicit drug use in the next six months, he obtained a low score (37.5) on the Precontemplation scale of the URICA along with high scores on the Contemplation (60.2) and Maintenance (64.0) scales.

Consistent with his algorithm responses, the subject acknowledged that when he entered treatment approximately six weeks prior to the interview, he had no clear treatment goals. He said, "When I first came here, I didn't care about anything." He indicated only that he wanted relief from his withdrawal symptoms and from the financial burden of his drug habit. Asked why he entered treatment, he stated: "I hit rock bottom... I sold some of my jewelry.. I emptied my bank account... I wasn't eating and I didn't want to go out of the house except to cop." These statements are consistent with his Precontemplation and Contemplation scale scores; they indicate that he was very aware of the fact that he had a drug problem and that he wanted some kind of help in addressing it. At the same time, his elevated score on the Maintenance scale indicates that he had endorsed statements expressing a desire to maintain changes in his

behavior which he had already achieved. In the interview, the subject stated that with the aid of methadone and counseling, he had drastically reduced his drug use and felt much better about himself since entering treatment, though, at the time he completed the measures, he apparently had no plans to discontinue illicit drug use altogether. The case illustrates that the URICA notwithstanding, Precontemplation (as measured by the algorithm) need not be associated with any antipathy toward treatment, nor does it exclusively describe the behavior of individuals who lack an awareness of the problem.

This particular subject seemed to have passed into the Preparation stage by the time he was interviewed. During the interview, the subject indicated that he had not been using any illicit drugs besides marijuana for the past week and that he intended to stop using illicit drugs entirely, beginning immediately. He added that he had just run out of marijuana and did not plan to renew his supply. While the specimens he provided subsequent to the interview indicated continued regular use of illicit drugs including opiates, cocaine, and amphetamines, he did provide 4 "clean" urine specimens (20%) of a total of 20 during the three-month follow-up period.

Just as the previous subject seemed to have moved up a stage by the time of the interview, one of the Contemplators seemed to have regressed a stage, or perhaps she simply did not give much thought to her responses on the algorithm. Her case will be discussed in this section because it also illustrates some of the points made above. In terms of her plans to discontinue drugs, this subject indicated in the June interview that she did not believe she would even start getting clean until January when her boyfriend was scheduled to be released from prison. This patient did not produce a single "clean" urine specimen in the entire three-month follow-up period. Her urine screens indicated regular use of opiates, cocaine, and benzodiazepines with occasional use of other drugs

as well. The subject stated that she used drugs to escape feelings of hopelessness and loss. She could see no alternative and had no plans to change her behavior in the near future. Asked about the obstacles in the way of achieving her goal of discontinuing illicit drug use, she stated: "The feeling that I have nothing to get clean for... I used to want to get clean for my family... Now it sometimes feels hopeless."

Like the Precontemplator who also had no plans to discontinue illicit drug use, this subject obtained a score over one standard deviation below the mean (37.5) on the Precontemplation scale while obtaining elevated Contemplation and Maintenance scores (63.8 and 67.6 respectively). This subject was well aware that she had a problem and certainly saw the need for treatment. She mentioned that counseling, in particular, had been helpful. She also cited gains she had made since entering treatment. Previously homeless, she had found an apartment; she had almost stopped working as a prostitute; and she had reduced her heroin and cocaine use. Presumably, her elevated Maintenance score reflected her desire to sustain these changes. On the Processes of Change scales, she obtained elevated scores on Reevaluation (65.7) and Self Liberation (64.8) and low scores on Reinforcing Relationships (37.7) and on Behavioral Processes (38.0). Her low scores on the last two scales are consistent with her statements in the interview that she had few supportive relationships in her life and was doing little to alter her drug using behavior. The high Reevaluation score is consistent with the interview in that the subject expressed awareness of the ways in which her drug use was negatively affecting herself and others. Her high score on Self Liberation indicates that she believed she was making commitments to herself not to use drugs, though evidently she was not holding to them. In describing her previous experience in treatment, this subject articulated the sometimes tenuous connection between intentions and behavior: "I always have the best intentions but it never works out."

CONTEMPLATION

As noted above, one of the four Contemplators seemed to have slipped back into Precontemplation; however one of the subjects classified in the Prepared stage by the algorithm seemed to have regressed to Contemplation so her case will be discussed in this section.

If these four subjects provide any indication, "contemplation" is a misnomer with respect to this population. The term suggests a degree of conscious reflection which was not evident during the interviews. The subjects drawn from this stage category indicated that they were not fully committed to giving up drugs, but they also gave the impression that little thought had gone into the question. They had some recognition that their drug use posed a problem, yet they seemed to have difficulty assuming responsibility either for the problem or the solution. Like the first Precontemplator, they all seemed relatively favorably disposed toward treatment, though they may not have had abstinence from illicit drugs as a goal. Indeed, three of them did not seem to distinguish clearly between reducing illicit drug use and abstaining altogether. They all expressed a rather passive attitude toward the problem, entertaining the vague hope that some influence outside themselves would eventually take away their desire to use illicit drugs. They varied in the percentage of "clean" urine specimens produced from 0 to 74%.

The first of these subjects contradicted himself repeatedly regarding his intentions to change, expressing no clear conviction on the issue and finally locating the impetus for change in the clinic rather than within himself. Prior to the study, this man had been a regular user of benzodiazepines. When he was interviewed, two months after he completed the measures, he initially stated that he planned to complete a

benzodiazepine detoxification regimen in the next week and to remain free of illicit drugs after that. He added that he had planned to discontinue all illicit drug use since he entered treatment six months prior to the study. However this statement conflicted with another statement he had made about the beneficial effects of treatment; referring to his earlier success at discontinuing propoxyphene use, he stated that before entering treatment, he had no "enthusiasm" for giving up this drug. When reminded of this statement, he corrected himself and asserted that he had always wanted to discontinue drug use but did not know how. Finally, he conceded that he actually wanted to continue using benzodiazepines for a while but the program psychiatrist said that he could not. This subject's URICA scores all fell within one standard deviation of the mean, though like the Precontemplator above, he obtained his highest score on the Maintenance scale.

This subject did manage to discontinue drug use for a significant portion of the three-month follow-up period. However his abstinence did not appear to be the result of a developmental process or even of a conscious commitment to give up drugs. When asked what he had been doing to achieve the goal of illicit drug abstinence, the subject stated, "...to tell you the truth, I look for the clinic to do it.... I got off Darvon [propoxyphene] because I got a 10 milligram increase [in his methadone dose]..." This subject's Processes of Change score profile was consistent with the notion that he was taking very little action to alter his behavior; he obtained his lowest score on Behavioral Processes (38.7). None of his other scores differed from the mean by more than a standard deviation. For this individual, the methadone itself and the structure provided by the clinic were apparently enough to change his behavior even without a conscious commitment on his part. It should be noted however, that this subject reverted to

regular illicit drug use prior to the end of the follow-up period and was subsequently administratively discharged.

Two Contemplators indicated in the interviews that they had already essentially stopped using drugs, though their urine screens suggested that their notion of "stopping" did not preclude at least occasional drug use. One of these subjects indicated abstinence from illicit drugs had been her goal since she entered treatment, though she acknowledged, "...I still sometimes think about smoking a joint." She denied recent drug use except for "occasional" marijuana use, though her urine screens indicated at least one episode of cocaine use and one episode of benzodiazepine use in addition to regular marijuana use in the month prior to the interview. The subject did not give the impression that she was intentionally lying about this use, but rather that she viewed it as too insignificant to merit consideration. She could cite no obstacles to impede her progress, though she obtained no "clean" urine screens during the follow-up period. The urine screen results indicated that her marijuana use continued unabated and was supplemented with sporadic use of cocaine and opiates. Her URICA and Processes of Change scores were noteworthy for low scores on Self-Liberation and Behavioral Processes - scores which were again consistent with the interview data. This woman's answers to interview questions suggested that she had not given much thought to the notion of making a conscious choice about whether or not to use drugs and that she was doing very little to alter her behavior. All of her URICA scores were within one standard deviation of the mean, though she obtained her highest score on the Maintenance scale. As with the Precontemplator, this elevated score seemed to reflect her relative satisfaction with the progress she had made.

When asked about her recent drug use, the third Contemplator indicated that she had "cut down almost all together," although all of her drug screens for the past two months had been positive for illicit drugs and all but two of them had been positive for opiates. She did mention that she was "having a problem" with her urine results in that she was aware that they indicated continued use of various drugs. She did acknowledge opiate use approximately once per week but seemed to view this as trivial. In her June interview this subject indicated that she planned to discontinue all drug use by the end of the summer. She did not indicate why her drug use would stop by the end of the summer except that she planned to enroll in school at that time. When asked why it would take that long, she answered: "Because I get nervous and upset and when I take a Valium, they consider that a dirty urine." Her statement indicates an awareness of external pressures to discontinue all use but a lack of conviction regarding the merits of illicit-drug abstinence. She did not meet her stated goal of discontinuing drug use by the end of the summer, though she did provide some urine specimens which were negative for illicit drugs (15%).

Though she had been originally classified in the Prepared stage, one subject indicated by her interview responses that she had regressed at least to the Contemplation stage. When asked about her treatment goals, the subject stated that she had originally planned to discontinue <u>all</u> drugs, though she had changed her mind and now wanted to remain on "a low dose" of benzodiazepines until she was able to get away from her husband. She viewed her marriage as intolerable and apparently viewed continued drug use as the only way to deal with it. However, she had no specific plans for ending the marriage or getting away from her husband. During the three-month follow-up period, she obtained a single "clean" urine, though her drug use was restricted to benzodiazepines for the most part.

Asked what she was doing to achieve her goals of getting away from her husband and eventually getting off of drugs, the subject was stated that she couldn't think of anything. She stated that she had managed to achieve a past period of abstinence from illicit drugs by keeping herself busy, though she stated that she was not doing this now. Her main method of coping seemed to be to project blame for her difficulties on her husband and others, including the clinic staff whom she railed against because they had been asking her to pay her clinic fees. She obtained low scores on Reevaluation (39.6), Self Liberation (34.3), and Behavioral Processes (27.3). These scores are consistent with the interview in that she did not seem to view her current drug use as posing a particular problem for herself or others; she was doing little to alter her behavior; and she was not committed to discontinuing illicit drugs. She seemed to view her drug use not as a choice, but as the only means of coping with circumstances forced on her by others. Like the other Contemplators, she seemed to be waiting for an external event prior to taking any steps to change.

PREPARATION

The three remaining interview subjects in this stage achieved varying reductions in their use of illicit drugs. They did seem to demonstrate a greater commitment to illicit-drug abstinence than those in the previous stages, and they were beginning to take steps to change their drug-using behavior. Two of the subjects in this stage managed to provide a significant proportion of "clean" urines during the follow-up period.

One of these subjects described a gradual transition in his attitude toward his drug problem and toward treatment. He had been in treatment for three months before completing the questionnaires and he was interviewed six weeks after that. When asked whether his treatment goals had changed since his admission, he replied, "I don't

remember what my goals were when I came in here except to stop hurting and function and halfway hold myself together... I wanted to get some kind of sanity in my life... I don't know what kind of lies I told those people when I first got in here... Mostly I wanted not to be sick and second I wanted to get some stability." Asked what was going on in his life at the time he decided to seek treatment, the subject stated: "For the first time in my life, I was stomped down on my ass." He reported that he had no regular place to live; he was spending all of his time trying to obtain drugs; he was not taking baths; and his drug use and withdrawal symptoms were making him "crazy." He described waking up in the morning sick with withdrawal symptoms and having to steal before breakfast to support his habit. At this time, he apparently also submitted a "dirty" urine specimen to his parole officer who told him that if he did not do something about his drug problem he would end up back in jail.

The subject described going through a process of reevaluating his situation after he entered treatment. Though he initially had no intention of giving up drugs, once he became stabilized on methadone he stated that he was able to realize how bad his problem was: "I knew what they were talking about in meetings when they talked about hitting bottom." At the time he was interviewed, the subject reported that he was making an effort to avoid the people who encouraged drug use and situations in which he felt tempted to use in the past. He stated also that he was meeting regularly with his counselor and attending group training sessions on interpersonal problem solving. He provided 74% "clean" urine specimens during the follow-up period. His URICA scale scores were noteworthy for the fact that he obtained his highest score on the Maintenance scale (67.6). Despite the fact that his urine screens indicated at least weekly use of opiates prior to completion of the measures, this subject endorsed items indicating that he viewed his drug problem as resolved to some extent.

The second Prepared subject also achieved a significant increase in "clean" urines during the three-month follow-up. He stated that he never wanted to use illicit drugs again and hoped to be off of methadone in about six months. This subject stated that in order to achieve his goal of abstinence, he had been engaging alternate activities (i.e. going to school) and that he had been avoiding the people and places associated with drug use. He named his counselor and his girlfriend as people in his life who support his abstinence.

Like the previous subject, the second Prepared subject obtained his highest URICA score on the Maintenance scale, though his urine screens indicated use of opiates, cocaine, and marijuana in the week prior to completion of the measures. In fact, this subject had been admitted to methadone treatment only five days before completing the questionnaire, yet his responses indicate that he viewed himself as working to maintain changes in his drug using behavior. This subject subsequently relapsed to regular opiate use and sporadic use of cocaine and benzodiazepines. Sixty-two percent of the urine specimens he submitted during the follow-up period were negative for illicit substances.

The third Prepared subject, too, had made some progress with respect to his drug problem. His urine screens indicated that he had not used cocaine or opiates for over a month prior to completion of the measures, though all of his urine specimens were positive for marijuana. Over the three-month follow-up period, he produced no "clean" urine specimens, but 62% were positive for marijuana only. During the interview the subject stated that he had not used illicit drugs of any kind for the past two weeks. He reported that since entering treatment, he had obtained a job, regained his previously suspended driver's license, opened a bank account and regained the respect

of his family. Asked what he had been doing to achieve his goals, the subject indicated that he had been engaging in activities included on the Behavioral Processes scale (e.g. finding other things to do besides use drugs, avoiding people and situations associated with drug use). None of his URICA or process scores deviated from the mean by more than one standard deviation.

ACTION

Three subjects participated in the interview who had been classified into the Action stage on the basis of the algorithm. These subjects had been in treatment at Clinic 1 for periods ranging from four months to nineteen months. Their drug screens indicated that all three had stopped using illicit drugs immediately after they were admitted to the program; all had maintained abstinence from illicit drugs for periods of months but continued to use illicit drugs episodically. In the three-month follow-up period, they obtained percentages of clean urine specimens ranging from 85% to 92%. In examining the interview data for clues as to what enabled these subjects to effect significant changes in their behavior, the most striking commonalty was that each subject cited his spousal relationship as providing the impetus to change. Nothing else in their personal or social histories clearly distinguished these subjects from those in the earlier stages.

The first subject described his wife's impact on his decision to discontinue illicit drug use as follows: "She got pretty drastic about it and threw me out of the house... it created a little incentive for me. It gave me that little extra push that I guess I needed." The second subject used similar language to describe his wife's influence: "I was afraid she would throw me out if she found out I was using heroin." The third subject reported that his wife gave him an "ultimatum." She told him that if he wanted to stay

with her, he would have to quit using drugs. As he put it: "she gave me the kick I needed to get into counseling."

These relationships contrast sharply with those described by interview subjects in the earlier stages. The sole Precontemplator was single. All four of the Prepared subjects reported that their sexual partners were drug users. Of the four Contemplators, three reported that they were involved with drug users. The fourth subject reported that his wife was not a drug user; however, she seemed to have great tolerance for his drug using behavior. He reported that he had been on methadone maintenance throughout their thirteen-year marriage. Recounting how his drug use had marred their honeymoon, the subject recalled how he had forgotten his take-home bottles of methadone; as a result, he suffered severe withdrawal symptoms and was forced to spend much of his honeymoon in search of pharmaceutical narcotics. At the time of the interview, the subject reported that his wife provided financial support for his family. He mentioned that recently he had been "trying to help out around the house" but continued to spend most of his time watching T.V.

Interestingly, despite their statements clearly attributing a large measure of their success to their relationships, none of the three Action subjects achieved his highest Processes of Change scores on the Reinforcing Relationships scale. In fact, two of the subjects had their lowest process scores on this scale, both obtaining scores a few points below the mean. The third subject obtained a high score on this scale (64.0); however it was his second lowest Processes of Change scale score. The items on this scale are worded to ask if subjects have people in their lives who reward them for not using drugs or to whom they can turn for support in times of difficulty. Though there is no such process in the model, it would appear that it may be equally important for

addicts to have others in their lives who provide negative consequences for continued illicit drug use.

MAINTENANCE

The two interview subjects in the Maintenance stage obtained patterns of URICA and Processes of Change scale scores which differed markedly from the averages obtained by the Maintenance subjects in the larger sample; however, their interviews suggest that these scores accurately reflect the clinical pictures presented by these patients. Their URICA and processes of change scores were more consistent with the Precontemplation stage than with Maintenance, suggesting that they were doing very little to change their behavior regarding illicit drug use. Having maintained abstinence from illicit drugs for many years, both subjects denied any concerns about relapse and seemed to regard the problem of illicit drug use as largely irrelevant. They did not see themselves as actively involved in the change process because they viewed the methadone itself as maintaining their changes for them. Neither subject produced a single "dirty" urine specimen during the three-month follow up period.

The first of these subjects reported a long history of polysubstance dependence. She reported entering methadone maintenance treatment initially about eleven years prior to the study. At that time, she stated that her goal was to get away from illegal narcotics and prevent the symptoms of opioid withdrawal. Although she wanted to discontinue illicit opiate use, she described an initial state of Precontemplation with respect to other illicit drug use. Methadone, she stated, enabled her to continue using cocaine and benzodiazepines for pleasure. She stated that several years after entering treatment, she decided to stop using drugs altogether because she had accumulated large debts and the drugs were too expensive. At that time, she stopped associating with drug-using

friends and never went back to using illicit drugs. Asked what had enabled her to make this decision, she described what sounded like a process of Reevaluation, stating, "I came to appreciate the situation I had gotten myself into." This situation included regular visits to inner city shooting galleries where strangers injected her in the neck; she could no longer inject herself because all of her more accessible veins were ruined. She realized that this was not where she wanted to be. Asked why she thought others continued to use drugs under similar circumstances, she hypothesized that such people experience a sense of futility which comes from never having known anything different.

This subject described no aspect of treatment as helpful, expressing resentment even toward methadone: "I substituted an acceptable addiction for another one." She described no difficulty in staying clean currently and no desire to get off of methadone in the foreseeable future. This subject obtained her highest URICA score on the Precontemplation scale (53.2) while obtaining low scores on Contemplation (13.2) and Maintenance (35.4). The low Contemplation score is consistent with her belief that treatment has nothing to offer her while her low Maintenance score likely reflects her sense that she needs no help in maintaining the changes she has achieved.

The other Maintainer reported a history of prescription drug dependence only. She reported that she discontinued use of all of her prescribed pain medications immediately after enrolling in methadone maintenance treatment four years prior to the study. She made it clear that she no longer viewed illicit drug use as a problem and that she needed no help in abstaining from illicit drugs. She viewed her only current drug-related problem as methadone dependence, describing counseling as useful only in that it provides her with "someone to talk to about methadone and what it does to you."

This subject's data were discarded from the analyses in Study 2 because her URICA scores all constituted such extreme outliers: Precontemplation (84.5), Contemplation (9.6), Action (10.7), Maintenance (10.4). Her Processes of Change scores were also extremely low: Reevaluation (25.7), Self-Liberation (24.1), Reinforcing Relationships (34.8), Behavioral Processes (35.4). Of course this pattern of scores contradicts the predictions of the model for subjects in the Maintenance stage, but it is quite consistent with the attitudes expressed by this subject during the interview. She made it clear that she does not view illicit drug use as a problem. She saw no need for treatment regarding any aspect of this problem nor any need to engage in any activities geared toward abstinence. She stated that she planned to be off of methadone by the end of the summer, though she had voiced similar plans of imminent detoxification for at least two years prior to the study. She remains on methadone maintenance today.

COMMON FEATURES

The common features of the interviews illustrate the significance of the difficulties faced by many methadone patients and highlight the differences between discontinuing chronic abuse of narcotics and changing other types of problem behavior. More striking than any other aspect of the interviews was the extent to which subjects shared histories of trauma, neglect, and abuse - histories which most of them related with little or no emotion or apparent comprehension of seriousness of the difficulties they had faced. Of the fourteen subjects, four reported histories of some kind of childhood sexual abuse or sexual assault. A fifth reported a more recent history of three incidents of stranger rape in which weapons were used. Three more subjects reported histories of physical abuse by their fathers. Two subjects reported histories of traumatic

injuries suffered as adults - one subject lost all the fingers on one hand as a result of a car accident. Another suffered a gunshot wound to the abdomen. Nearly all subjects reported that at least one of their parents was an alcoholic or drug addict.

Typical of the manner in which the subjects related these experiences was one subject's response to a question as to whether he had ever been physically abused. He replied matter-of-factly: "No, my pop used to beat me but that was just a normal thing." Upon further questioning, the subject reported that his alcoholic father routinely punched him in the face and beat him with a belt. Sometimes these beating were administered with the buckle-end of the belt and routinely induced bleeding. The subject acknowledged that he was taken to the hospital by his grandmother on one occasion after his father punched him in the stomach. Regarding this incident, the subject stated: "I think I was just putting on a show... doing it more for attention than anything."

The subject reported his rather extensive medical history with the same apparent disregard for his own well-being. When asked if he had ever had any serious medical problems, the subject replied without irony: "No... well gunshot wounds but I don't know if that's considered serious." He reported that he had been shot on two separate occasions. In the first instance, the subject suffered a broken bone as a result of being shot in the arm during a drug deal. In the second incident, he was shot when he attempted to intervene in a fight between two of his friends and a police officer. One of the friends was killed in the altercation. The subject reported that he was shot in the back and abdomen. He reportedly spent two months in the hospital as a result of the injuries and also required a later operation to repair damage to his intestines. Yet, he was not certain as whether these problems could be considered serious.

When asked whether she had experienced any serious medical problems, another subject replied, "No... oh, I had cancer when I was twenty-three." The subject was 32 at the time of the interview. When questioned, she explained that she had been diagnosed with cervical cancer and that her treatment involved a hysterectomy. She stated that she had undergone occasional checkups "once in a while" since then and denied that she worried about it. She mentioned the cancer almost as an afterthought. Indeed, in the context of her history of repeated rapes, physical abuse, homelessness and prostitution, perhaps the cancer did not seem so serious.

Another subject reported that, throughout his childhood, his stepfather regularly beat him with a broomstick and a belt. Some of these beatings resulted when the subject screamed or attempted to intervene in the beatings his mother received from the stepfather. The subject reported that his stepfather regularly beat his mother's head against the wall. Asked about his parent's reaction when they learned of his drug use, the subject reported that around age 17, he frequently smoked crack in front of his parents. He added: "They didn't think it was hurting me. They thought it was like cigarettes or something." This was difficult to understand until the subject explained that his step-father was a cocaine dealer. The subject added that when he was sixteen or seventeen, his step-father routinely took him along on drug-dealing trips to test the quality of the cocaine he was buying. This subject did have some recognition that he had experienced a difficult childhood; he described it as "rough." However, he described it with very little emotion. He also mentioned that he sees his parents daily now. Asked to describe his father, he stated: "He's a good person... just once in a while..." He did not finish the sentence. He continued: "I care for him and all that... I forgave him for what happened. There's nothing I can do about it now."

Another subject reported a history of sexual abuse by her stepfather beginning at age 10 and continuing until age 17. She stated that at that time she moved out of her mother's house to live with her biological father. She also reported the abuse to her mother, whom she believed had been unaware until then. The mother threw the stepfather out of the house but subsequently let him move back in. No longer able to stay with her biological father, a year later the subject moved back into the house with her mother and stepfather. Of her mother's decision to allow the stepfather back into the house, the subject said: "She gave her reasons and I accepted them." She stated that she had never discussed these events with anyone in any detail. In her view, "it's in the past."

In light of these histories, it is perhaps not surprising that most subjects either implied or stated that narcotics served an anesthetizing function for them. The following are quotes taken from eight different interviews in answer to questions about the feelings induced by drugs (especially opiates): "nothing would bother me...;" "they made me forget about everything... my problems would go away;" "I just didn't give a f___;" "You don't have to worry about the bad things... I didn't worry about anything;" "They made everything be O.K.... anything could happen and it would feel all-right;" "Nothing bothered me;" "It made me feel good, relaxed... nothing bothered me." Perhaps attesting to the effectiveness of drug use in blocking painful feelings, subjects were typically not able to articulate exactly what would have been bothering them had they not been using drugs.

Similar to this tendency to disregard the possible emotional significance of past events or current circumstances, interview subjects evidenced a consistent inability to assess the magnitude of their drug problems. For the most part, subjects in this study

acknowledged few significant obstacles in the way of achieving their goals. Indeed, most seemed to take it for granted that they would achieve abstinence from illicit drugs in the immediate future and then detoxify from methadone within the next few months or years. Asked to rate their chances of success, most subjects cited a figure around 70% or 80%, although the majority of those in the first three stages of change did not manage to produce more than a few "clean" urine specimens during the three-month follow-up period.

With the exception of the two Maintenance patients, all the patients expressed a very positive attitude toward treatment and toward counseling. All acknowledged that methadone had helped them to cut down on their drug use and all stated that counseling had been very helpful to them. Even those in the earliest stages of change found their counseling sessions to be helpful. Since most of these patients continued to use illicit drugs regularly, it is not entirely clear in what way the counseling was helpful, but clearly the patients viewed it as a positive experience. Asked what kind of treatment would help them most, none of the patients articulated anything different from the treatment they were already receiving. Two of the Maintainers suggested some ways in which treatment might be changed to benefit others, but neither of them acknowledged any need for treatment themselves. Perhaps this consistency of opinion simply reflects the excellent treatment the patients were receiving and the optimism that this treatment inspired. However, it is difficult to imagine this level of patient satisfaction in any other treatment setting, particularly in light of the fact that for many patients, the problems for which they ostensibly sought treatment continued unabated. More likely, the consistent satisfaction with treatment stems from a lack of insight regarding the significance of the problem and of what is needed to change. Again, the data suggest that with the help of drugs, many methadone maintenance patients have learned to disregard their own

emotional states; as a result they may have difficulty articulating what they need or recognizing when their needs are not being met.

These issues again highlight an important difference between heroin use and other problems with which the stage and process measures have been used. The interviews suggest that for some patients, drug use constitutes an essential aspect of the way they handle traumatic histories and difficult circumstances. While they may wish to quit using drugs, many may be ill-equipped to handle the kinds of social, economic, and psychological difficulties which drug use helps to block from awareness. Indeed, such individuals may be in a state of Precontemplation regarding these kinds of problems, though these problems may, in turn, promote continued drug use. For these reasons, intentions and attitudes toward changing drug-using behavior may not always bear a strong relation to actual behavior.

GENERAL DISCUSSION

The "transtheoretical" model, developed by Prochaska and DiClemente, has become increasingly popular as a way of conceptualizing the process of behavior change and readiness to engage in treatment. The present investigation addresses the question of whether the model can be generalized to the problem of continued illicit drug use among patients in methadone maintenance treatment. The results suggest that the answer to this question is equivocal; however, both the success and failure of the model help to illuminate the process of therapeutic change in this population and the distinctive features of opiate addiction and of methadone treatment.

The results suggest that the model is useful insofar as it identifies in this population five relatively distinct stages of change, each characterized by different levels of readiness for change, different attitudes toward treatment, and by the use of different change processes and coping strategies. Stage distinctions do not definitively predict progress in treatment among those addicts who are still using illicit drugs. However, Study 2 suggests that patients in the Action and Maintenance stages are likely to remain abstinent from illicit drugs, at least in the short term. Although the differences in outcome between Precontemplators, Contemplators, and Prepared subjects in Study 2 did not achieve statistical significance, the coping styles and processes of change associated with the Precontemplation stage suggest that these patients are less likely than Prepared patients to achieve illicit-drug abstinence.

The continuous measure of stages of change (URICA) failed to exhibit the same factor structure in this study that it has in other populations. The hypothesized Maintenance items failed to load together and instead correlated highly with the items on

the Contemplation scale. Moreover, there was some evidence to suggest that higher Maintenance scale scores are associated with greater, not lesser, amounts of drug use. Apparently, many of those who have managed to maintain abstinence do not view themselves as actively working to prevent relapse. They may instead attribute their success to the effects of the methadone itself. Among those who continue to use drugs, high Maintenance scale scores may merely reflect satisfaction with the achievement some reduction in drug use or drug-related problems.

The results suggest that attitudes as measured by the URICA may correlate less strongly with intentions and behavior than the "transtheoretical" model might suggest. Of the confirmed URICA scales, only the Action scale was significantly related to self-reported recent drug use and none of the URICA scales predicted abstinence from illicit drugs during follow-up. This finding contrasts with at least one study which showed that Action scale scores predicted treatment drop-out and treatment progress in a weight reduction program (Prochaska, et. al., 1992). The present studies failed to provide support for a strong relationship between the URICA and drug-using behavior.

According to the model, both the URICA and the algorithm assess stages of change. The results of Study 1 suggest that the two measures are meaningfully related but also diverge significantly. Classification of subjects based on their highest URICA scale score did not converge with classification on the basis of the stage algorithm, suggesting that the two measures may assess slightly different phenomena. While the algorithm inquires about intentions to change behavior, the URICA seems to measure attitudes toward treatment and toward the problem of continuing drug use. It may be, for example, that the Maintenance and Contemplation scores assess hopefulness about the power of the program or methadone itself to provide relief from current difficulties.

The interview data and clinical experience suggest that many patients come to treatment with the naive belief that change will occur as a result of merely being in treatment but with little understanding of what personal effort may be involved. A positive attitude toward treatment may have relatively little to do with actually changing behavior. Similarly, Precontemplation may measure antipathy toward treatment. The interview data suggest that with the help of methadone, patients can maintain abstinence even as they maintain a negative attitude toward treatment per se.

With respect to the processes of change, the present investigation suggests that it may be possible to disregard some of the distinctions among the twelve different types of activities postulated by the model. Confirmatory factor analysis provided evidence for the validity of four different process scales, three of which combined items from related scales in the original twelve-factor model. These four scales demonstrated predicted relationships with the stages of change and with reported recent drug use. It may be that not all the theoretical distinctions among related processes have the same degrees of relevance when applied to drug addiction. However, it is also possible that methadone maintenance patients could benefit from treatments aimed at raising their awareness of the diversity of activities available to them in their efforts to change their behavior. The interview data suggest that some of the these patients may have little idea of the range of different actions they could take to avoid continued drug use. Since only the Behavioral Processes predicted treatment progress during follow-up, it remains for future studies to determine conclusively whether other processes (Reevaluation, Self Liberation, Reinforcing Relationships) also promote change in these patients. Such studies might incorporate an additional process scale assessing the extent to which patients are influenced by relationships with others who not only support abstinence but

who also provide negative consequences for continued drug use. The interview data suggest that such contingencies might be important in moving patients to take action.

The strong correlations between coping scales and measures of illicit drug use point to the need to consider the context in which heroin addiction occurs. In addition to their drug problems, many patients may lack or fail to implement adaptive coping abilities in other aspects of their lives. Those who continue to use illicit drugs may do so as a means of coping with stresses they face. The Study 1 results suggest that those patients who make use of some of the more adaptive coping strategies in response to stress are less likely to be using drugs. Although the findings need to be replicated in a larger sample, Study 2 suggests that in addition to using drugs and alcohol as a means of coping, the use of two other coping strategies may also predispose patients to continued illicit drug use. Specifically, patients may be likely to continue using drugs if they cope with stress by simply denying difficulties or by turning their problems over to God. An important part of the consciousness-raising process may involve making patients aware of the stress-mediating function that drug use serves and helping them to consider other more adaptive ways of managing those stresses. Those who are prepared to change may benefit from interventions aimed at teaching alternative problem-solving skills.

The investigation identifies a group of patients, namely Precontemplators, who pose a special challenge to treatment providers. Many of these patients have been in treatment for extended periods of time (over six years on average), yet despite all this treatment, they all plan to continue using illicit drugs. The results suggest that most of them use at least two classes of illicit drugs including opiates. On average, they are less likely to make use of adaptive coping strategies; they have little commitment to change

and little expectation or hope that treatment will be able to help them change. It is not inconsistent with the "transtheoretical" model that many people remain in this or any other stage for extended periods of time. Nonetheless, in principle, Precontemplation is conceived as a transitory state through which people pass in the course of therapeutic change. The present results suggest that, at least in the context of methadone maintenance, Precontemplation may be characterized by relatively entrenched attitudes and behavior patterns.

While it may be helpful in other respects, long-term methadone maintenance may have little effect on the continuing drug use of patients in the Precontemplation stage. One might even argue that supplying methadone to these patients helps them to maintain their illicit drug use more easily and comfortably. In response to this concern, some clinics discharge chronic illicit drug users from treatment as a matter of policy. No doubt this practice provides incentive for some patients to change their behavior. However discharged patients are likely to continue using drugs and committing crimes to support their habits while putting themselves and others at risk for diseases communicated through shared needles.

To address these problems, alternative programs could be designed with the explicit purpose of accommodating those who do not wish to completely discontinue their drug use. Such programs would not mandate discontinued drug use but they would also not ignore it. Instead, patients might be required to attend individual or group counseling sessions in which they could discuss the advantages and disadvantages of continued drug use. They could be provided with education geared toward minimizing health risks and apprising them of the hazards to physical and mental health posed by continued drug use. In this way, counselors would not waste time

trying to help patients accomplish goals not shared by the patients themselves. At the same time, patients might feel less pressure to dissemble about their goals in counseling sessions. Such an approach might facilitate the development of a more honest and collaborative relationship between patient and counselor. At the same time, it might help patients to engage more genuinely in some of the early processes of change, raising their awareness of making a conscious choice to continue using drugs, rather than simply failing to achieve an (ostensibly) desired end.

The relationship between time in treatment and stage of change has other important implications for treatment as well. The Study 1 results suggest that the proportion of patients in the Prepared stage decreases as a function of time while the proportion of Precontemplators increases. Since the study employs a cross-sectional rather than a longitudinal design, it is impossible to draw firm conclusions from these results, but they at least suggest that it may be important to aim intensive interventions at patients early in treatment. Patients who have been in treatment for extended periods of time without discontinuing illicit drug use may be much less amenable to change.

A future study might incorporate repeated assessments using the stage and process measures to determine whether the use of specific processes predicts movement through the stages. For example, are those Contemplators who make use of Self Liberation and Reinforcing Relationships more likely than others to graduate to the Preparation stage? Are those Maintainers who make less use of Behavioral Processes at greater risk for relapse? Such a study might also illuminate the history of those who have no intention of changing their behavior after years of treatment. It would be useful to know if the long-term Precontemplators identified in this study ever had any plans to change and if so, what went wrong.

The results of this investigation have important implications both for treatment and for future research. The study suggests that stage classification may be an important patient variable to consider in evaluating treatment effectiveness. Future studies might examine whether specific interventions are differentially effective for patients in different stages of change. While some interventions may have little effect on more traditional measures of outcome, they may be effective in moving patients out of the early stages of change and into Preparation. As a guide for intervention, the model's appeal lies in its simplicity and in its capacity to transcend differences among theoretical orientations to treatment. However, it is important not to underestimate the enormity of the problem based on the simplicity of the model. Long-term heroin addiction typically occurs in the context of a host of other psychosocial problems that help to maintain the addiction. In this respect, it is rather different from the problem of cigarette smoking upon which much of Prochaska and DiClemente's research focuses. One of the interviews illustrated the case of a father who failed to appreciate this distinction when he dismissed his son's use of crack cocaine as "like cigarettes or something." The study results and clinical experience suggest that many patients fail to comprehend both the magnitude of the problems they face and the effort required to overcome them. It is important that we as clinicians and researchers do not collude in this assessment. While the model provides broad guidelines for psychological interventions in methadone maintenance programs, front-line treatment providers continue to face a profoundly difficult challenge.

Appendix A

Demographic Characteristics of the Sample

	Clinic 1	Clinic 2	Clinic 3	Clinic 4	Total
Sample Size	43 (15.8%)	67 (24.5%)	95 (33.7%)	71 (26.0%)	N = 276
Gender					
males	27 (62.8%)	33 (49.3%)	44 (47.8%)	48 (67.6%)	152 (55.7%)
females	16 (37.2%)	34 (50.7%)	48 (52.2%)	23 (32.4%)	121 (44.3%)
missing data			3		3
Ethnic Background					
Black	4 (9.3%)	25 (37.3%)	34 (35.8%)	37 (52.1%)	100 (36.2%)
White	33 (76.7%)	27 (40.3%)	53 (55.8%)	32 (45.1%)	145 (52.5%)
Hispanic	5 (11.6%)	13 (19.4%)	7 (7.4%)	1 (1.4%)	26 (9.4%)
Other	1 (2.3%)	2 (3.0%)	1 (1.1%)	1 (1.4%)	5 (1.8%)
Age					
M - years	36.0	39.1	39.9	41.0	39.4
(SD)	(7.47)	(5.74)	(7.74)	(7.50)	(7.34)
Employment Status					
full-time	11 (25.6%)	5 (7.5%)	26 (27.4%)	10 (14.1%)	52 (18.8%)
part-time	3 (7.0%)	5 (7.5%)	6 (6.3%)	9 (12.&%)	23 (8.3%)
occasional	4 (9.3%)	2 (3.0%)	4 (4.2%)	3 (4.2%)	13 (4.7%)
unemployed	11 (25.6%)	17 (25.4%)	26 (27.4%)	35 (49.3%)	89 (32.2%)
homemaker	8 (18.6%)	13 (19.4%)	13 (13.7%)	8 (11.3%)	42 (15.2%)
disabled	6 (14.0%)	24 (35.8%)	19 (20.0%)	6 (8.5%)	55 (19.9%)
student		1 (1.5%)	1 (1.1%)		2 (0.7%)
Marital Status					
single	10 (23.3%)	21 (31.8%)	42 (44.2%)	21 (29.6%)	94 (34.2%)
married	18 (41.9%)	23 (34.8%)	17 (17.9%)	22 (31.0%)	80 (29.1%)
divorced/sep.	13 (30.2%)	17 (25.8%)	30 (31.6%)	17 (23.9%)	77 (28.0%)
other	2 (4.7%)	5 (7.6%)	6 (6.3%)	11 (15.5%)	24 (8.7%)
missing data		1			1
Education Level					
M - years	11.53	11.57	11.43	11.96	11.62
(SD)	(1.83)	(1.99)	(1.78(	(1.90)	(1.87)
GED. or H.S. grad.					
yes	23 (53.5%)	41 (61.2%)	53 (55.8%)	48 (69.6%)	165 (60.2%)
no	20 (46.5%)	20 (46.5%)	42 (44.2%)	21 (30.4%)	109 (39.8%)
Legal Status					
court referred	1 (2.3%)	1 (1.5%)	5 (5.3%)	1 (1.4%)	8 (2.9%)
missing data		2	1		3

	Clinic 1	Clinic 2	Clinic 3	Clinic 4	Total
Pre-Tx Drug Use History					
M - years	16.63	15.12	17.34	19.21	17.16
(SD)	(7.47)	(8.79)	(8.39)	(7.64)	(8.25)
missing data		2	1	3	6
Pre-Tx Opiate Use History					
M - years	12.00	12.51	13.81	15.93	13.74
(SD)	(9.67)	(9.24)	(8.86)	(9.15)	(9.22)
missing data		2	1	3	6
Time in Treatment (current clinic)					
M - months	18.38	65.79	54.96	32.47	46.08
(SD)	(37.42)	(67.34)	(66.22)	(36.10)	(58.56)
missing data		2	1	3	6
Take-Homes (per week)					
0	31	60	56	58	205
1-2	1	1	16	12	30
3-4	9	2	9	0	20
5-6	2	0	13	1	16
missing data		4	1		5

Appendix B

Comparison of Sample Demographic Characteristics with Demographics of the Clinic Populations

For Clinic 1, the sample and the clinic population were compared on sex, ethnic background, marital status, employment status, G.E.D. status, and number of take-homes. Using Bonferroni's adjustment, the only significant difference emerged in the area of employment status, χ^2 (2, N=144) = 15.90, p < .0001.

Table B.1
Numbers of patients in each of three employment status categories: Clinic 1 sample vs. Clinic 1 population.

Employment Status	Clinic 1 sample (n = 43)	Clinic 1 total (n = 101)
	observed value (expected value)	observed value (expected value)
full time	11 (15.8)	42 (37.2)
unemployed	11 (15.8)	42 (37.2)
other (part-time, seasonal, disabled, homemaker, etc.)	21 (11.3)	17 (26.7)

Note. Clinic 1 total census figures were calculated from patient intake data and are not necessarily up to date. In addition, they reflect the clinic census at a single point in time. The Clinic 1 sample was recruited over a two-month period. Therefore these figures are treated as estimates of the actual Clinic 1 population parameters.

The sample had smaller proportions of full-time employed and unemployed patients than the clinic population, while, the group which included homemakers, disabled clients, and part-time workers was over-represented in the sample (see Table B.1).

For Clinic 2, the sample and the clinic population were compared on sex, ethnic background, marital status, employment status, and number of take-homes. Again, the

only significant difference was in the area of employment status, χ^2 (3, N=246) = 28.46, $p < .0001$.

Table B.2
Numbers of patients in each of three employment status categories: Clinic 2 sample vs. Clinic 2 population.

Employment Status	Clinic 2 sample (n = 67)	Clinic 2 total (n = 179)
	observed value (expected value)	observed value (expected value)
full time	5 (18.2)	62 (48.8)
unemployed(incl. homemakers & students)	31 (31.3)	84 (83.7)
part-time/seasonal	7 (3.3)	5 (8.7)
disabled	24 (14.2)	28 (37.8)

Note. The accuracy of the Clinic 2 total census data is unknown therefore these figures are treated as estimates of the actual Clinic 2 population parameters.

Disabled clients and those reporting part-time employment were over-represented in the sample, while those reporting full-time employment were under-represented (see Table B.2).

For Clinic 3, the sample and the clinic population were compared on sex, ethnic background, employment status and number of take-homes. Once again, the only significant difference occurred in the area of employment status, χ^2 (4, N=408) = 23.67, $p < .0001$. Disabled clients were over-represented in the sample while clients reporting full-time employment were under-represented (see Table B.3).

Table B.3
Numbers of patients in each of three employment status categories: Clinic 3 sample vs. Clinic 3 population.

Employment Status	Clinic 3 sample (n = 95)	Clinic 3 total (n = 313)
	observed value (expected value)	observed value (expected value)
full time	26 (39.4)	143 (129.7)
unemployed	26 (24.9)	81 (82.1)
part-time/seasonal	10 (9.5)	31 (31.5)
disabled	19 (8.4)	17 (27.6)
other (inc. homemakers and students)	14 (12.8)	41 (42.2)

Note. The accuracy of the Clinic 3 total census data is unknown therefore these figures are treated as estimates of the actual Clinic 3 population parameters.

For Clinic 4, only sex, ethnic background, and take-home data were available on the clinic population. The clinic did not provide information regarding how many take-homes clients received but only how many clients received any take-homes. The sample did not differ significantly from the clinic population on any of these variables. It is likely, however, that as in the other samples, the Clinic 4 sample had a smaller proportion clients reporting full-time employment and a greater proportion reporting unemployment, disability, and/or part-time employment status. It is not surprising that the samples differ in these ways since those clients who were employed full-time would presumably have less time available to participate (they have to go to work) and perhaps less incentive to earn the $10 subject payment (they earn a steady income).

Appendix C

I.D.#_____ Date:_____

Drug Use History

1. How many days in the past 30 did you use any type of opiate drug besides methadone? (e.g., heroin, morphine, codeine, Percocet, etc.) _____ days (0-30)

2. When was the last time you used any kind of opiate besides methadone? _____ / _____ month year

3. How many days in the past 30 did you use cocaine? _____ days (0-30)

4. When was the last time you used cocaine? _____ / _____ month year
_____ never used

5. How many days in the past 30 did you use benzodiazepines? (e.g., Valium, Xanax, Ativan, Halcion, Librium, etc.) _____ days (0-30)

6. If you did use benzodiazepines, how did you obtain them? (check all that apply)
_____ bought on the street
_____ legitimate prescription
_____ falsely obtained prescription
_____ forged prescription
_____ other

7. If you use them, is your benzodiazepine use approved by the medical director or a program physician? _____yes _____no
_____do not use

8. When was the last time you used benzodiazepines? _____ / _____ month year
_____ never used

9. How many days in the past 30 have you used marijuana or hashish? _____ days (0-30)

10. When was the last time you used marijuana or hashish? _____ / _____ month year
_____ never used

11. How many days in the past 30 did you use a mood-altering drug not mentioned above? (e.g. Darvon, amphetamines, barbiturates, etc.) Do not include coffee, cigarettes, or alcohol. specify drug_____ _____ days (0-30)

12. When was the last time you used a mood-altering drug not mentioned above? specify drug(s)_____ _____ / _____ month year
_____ never used

Appendix D

I.D. #_____ Date:_____

Stages of Change Algorithm

1) **If you have used any illicit drugs in the past 30 days, do you plan to quit all use of illicit drugs within the next thirty (30) days?** Illicit drugs include any mood-altering drugs which are not approved for your use by a program physician. (e.g. heroin, codeine, Percocet, cocaine, Valium, Xanax, marijuana, Darvon, barbiturates, amphetamines, etc.) For our purposes, illicit drug use does not include alcohol, tobacco, caffeine, or prescribed methadone.

_____ Yes, I plan to quit all use in the next 30 days.
_____ No, I do not plan to quit all use in the next 30 days.
_____ N/A I have not used illicit drugs in the past 30 days.

2) **Do you plan to quit all use of illicit drugs within the next three (3) months?**

_____ Yes, I plan to quit all use in the next 3 months.
_____ No, I do not plan to quit all use in the next 3 months.
_____ N/A I have not used illicit drugs in the past 30 days.

3) **Do you plan to quit all use of illicit drugs within the next six (6) months?**

_____ Yes, I plan to quit all use in the next 6 months.
_____ No, I do not plan to quit all use in the next 6 months.
_____ N/A I have not used illicit drugs in the past 30 days.

4) **If you do not plan to quit all use of illicit drugs within the next three (3) months, which types of drugs do you think you will continue to use?** (check all that apply)

_____ opiates (heroin, codeine, morphine, Percocet, etc.)
_____ cocaine
_____ benzodiazepines (Valium, Xanax, Ativan, etc.)
_____ marijuana or hashish
_____ other (specify_____)

5) **If you do not plan to quit all use of illicit drugs within the next six (6) months, which types of drugs do you think you will continue to use?** (check all that apply)

_____ opiates (heroin, codeine, morphine, Percocet, etc.)
_____ cocaine
_____ benzodiazepines (Valium, Xanax, Ativan, etc.)
_____ marijuana or hashish
_____ other (specify_____)

Appendix E

URICA

I.D.#_____ Date:_____

Change Assessment Scale

This questionnaire is to help us better understand the way you view your drug use. Each statement describes how a person might feel when starting treatment or approaching problems in their life. Please indicate how much you agree or disagree with each statement. In each case, make your choice in terms of how you feel right now, not what you have felt in the past or would like to feel. **For all the statements that refer to your "problem," answer in terms of your illicit drug use. Illicit drugs include any mood-altering drugs which are not approved for your use by a program physician.** (e.g. heroin, codeine, cocaine, Valium, Xanax, marijuana, Darvon, barbiturates, amphetamines, etc.) For our purposes, illicit drug use does not include alcohol, tobacco, caffeine, or prescribed methadone. Note that "here" refers to the place of treatment or the program.

There are FIVE possible responses to each of the items in the questionnaire:

1 = Strongly Disagree
2 = Disagree
3 = Undecided
4 = Agree
5 = Strongly Agree

PROBLEM = ILLICIT DRUG USE	STRONGLY DISAGREE	DISAGREE	UNDECIDED	AGREE	STRONGLY AGREE
1) As far as I'm concerned, I don't have any problems that need changing.	1	2	3	4	5
2) I think I might be ready for some self-improvement.	1	2	3	4	5
3) I am doing something about the problems that had been bothering me.	1	2	3	4	5
4) It might be worthwhile to work on my problem.	1	2	3	4	5
5) I'm not the problem one. It doesn't make much sense for me to be here.	1	2	3	4	5
6) It worries me that I might slip back on a problem I have already changed, so I am here to seek help.	1	2	3	4	5
7) I am finally doing some work on my problem.	1	2	3	4	5
8) I've been thinking that I might want to change something about myself.	1	2	3	4	5

1 = Strongly Disagree
2 = Disagree
3 = Undecided
4 = Agree
5 = Strongly Agree

PROBLEM = ILLICIT DRUG USE

		STRONGLY DISAGREE	DISAGREE	UNDECIDED	AGREE	STRONGLY AGREE
9)	I have been successful in working on my problem but I'm not sure I can keep up the effort on my own.	1	2	3	4	5
10)	At times my problem is difficult, but I'm working on it.	1	2	3	4	5
11)	Being here is pretty much of a waste of time for me because the problem doesn't have to do with me.	1	2	3	4	5
12)	I'm hoping this place will help me to better understand myself.	1	2	3	4	5
13)	I guess I have faults, but there's nothing that I really need to change.	1	2	3	4	5
14)	Besides taking methadone, I can't think of anything I really need to do about my problem.	1	2	3	4	5
15)	I have a problem and I really think I should work on it.	1	2	3	4	5
16)	I'm not following through with what I had already changed as well as I had hoped, and I'm here to prevent a relapse of the problem.	1	2	3	4	5
17)	Even though I'm not always successful in changing, I am at least working on my problem.	1	2	3	4	5
18)	I thought once I had resolved the problem I would be free of it, but sometimes I still find myself struggling with it.	1	2	3	4	5
19)	I wish I had more ideas on how to solve my problem.	1	2	3	4	5
20)	I have started working on my problems but I would like help.	1	2	3	4	5

1 = Strongly Disagree
2 = Disagree
3 = Undecided
4 = Agree
5 = Strongly Agree

PROBLEM = ILLICIT DRUG USE

		STRONGLY DISAGREE	DISAGREE	UNDECIDED	AGREE	STRONGLY AGREE
21)	Maybe this place will be able to help me.	1	2	3	4	5
22)	I may need a boost right now to help me maintain the changes I've already made.	1	2	3	4	5
23)	I may be part of the problem, but I don't really think I am.	1	2	3	4	5
24)	I no longer have a problem, so there is very little for me to work on here.	1	2	3	4	5
25)	Anyone can talk about changing; I'm actually doing something about it.	1	2	3	4	5
26)	All this talk about psychology is boring. Why can't people just forget about their problems?	1	2	3	4	5
27)	I'm here to prevent myself from having a relapse of my problem.	1	2	3	4	5
28)	It is frustrating, but I feel I might be having a recurrence of a problem I thought I had resolved.	1	2	3	4	5
29)	I have worries but so does the next guy. Why spend time thinking about them?	1	2	3	4	5
30)	I am actively working on my problem.	1	2	3	4	5
31)	I would rather cope with my faults than try to change them.	1	2	3	4	5
32)	After all I had done to try and change my problem, every now and again it comes back to haunt me.	1	2	3	4	5
33)	I am really working hard to change.	1	2	3	4	5
34)	I hope that someone here will have some good advice for me.	1	2	3	4	5

Appendix F

I.D #_____ Date:_____

Processes of Change Questionnaire

This questionnaire is designed to help give us a better understanding of what strategies you may be using in your treatment. Each statement describes a situation or thought that a person might use to help them not use illicit drugs. Illicit drugs include any mood-altering drugs which are approved for your use by a program physician. (e.g. heroin, codeine, cocaine, Valium, Xanax, barbiturates, amphetamines, marijuana, etc.) For our purposes, illicit drug use does not include alcohol, tobacco, caffeine, or prescribed methadone. **Please read each statement and circle the number in the right hand column that best describes how often you make use of the particular situation or thought to help you not use illicit drugs right now.**

There are FIVE possible responses to each of the items in the questionnaire:

1 = Never
2 = Seldom
3 = Occasionally
4 = Frequently
5 = Repeatedly

		NEVER	SELDOM	OCCASIONALLY	FREQUENTLY	REPEATEDLY
1)	I keep things around my home or work that remind me not to use drugs.	1	2	3	4	5
2)	I find it helpful to do something physically active to keep from using drugs.	1	2	3	4	5
3)	I do something nice for myself when I don't give in to my urge to use drugs.	1	2	3	4	5
4)	Someone in my life lets me know about how my drug use is affecting me personally.	1	2	3	4	5
5)	I am frightened by some of the situations I have found myself in as a result of my involvement with drugs.	1	2	3	4	5
6)	I tell myself that I can choose to use drugs or not to use drugs.	1	2	3	4	5
7)	I use prescribed medications (besides methadone) to help me deal with anxiety or depression which might otherwise lead me to use drugs.	1	2	3	4	5
8)	I change personal relationships which contribute to my drug use.	1	2	3	4	5
9)	I see signs in some public places trying to help people not use drugs.	1	2	3	4	5
10)	I stop to think about how my drug use is hurting people around me.	1	2	3	4	5
11)	I am ashamed of some of my behaviors while using drugs.	1	2	3	4	5

1 = Never
2 = Seldom
3 = Occasionally
4 = Frequently
5 = Repeatedly

		NEVER	SELDOM	OCCASIONALLY	FREQUENTLY	REPEATEDLY
12)	Information from the media (magazines, newspaper, radio, T.V.) about drugs seems to catch my eye.	1	2	3	4	5
13)	I remove things from my home or work that remind me of using drugs.	1	2	3	4	5
14)	I find other ways to relax myself instead of using drugs to relieve stress and tension.	1	2	3	4	5
15)	I notice that I am rewarded by others when I don't use drugs.	1	2	3	4	5
16)	I have found a supportive group of people with whom I can talk about my drug problem.	1	2	3	4	5
17)	I feel frightened by the strength of my urges to use drugs.	1	2	3	4	5
18)	I make commitments to myself to not turn to drugs at times when I am feeling anxious or unsure of myself.	1	2	3	4	5
19)	I drink to help me not use drugs.	1	2	3	4	5
20)	I avoid people who encourage drug use.	1	2	3	4	5
21)	I notice that people who are quitting drugs are speaking out against peer pressure to use drugs.	1	2	3	4	5
22)	I think about the ways in which the people around me would be better off without my drug abuse.	1	2	3	4	5
23)	I get upset with myself when I think about my drug problem.	1	2	3	4	5
24)	I have heard that drug use may result in severe mood swings and depression.	1	2	3	4	5
25)	I avoid situations that encourage me to use drugs.	1	2	3	4	5
26)	When I am tempted to use drugs, I try to distract myself by doing something else.	1	2	3	4	5
27)	I have someone who listens when I need to talk about my drug use.	1	2	3	4	5
28)	Dramatic presentations of the dangers of drug use affect me emotionally.	1	2	3	4	5

		1 = Never 2 = Seldom 3 = Occasionally 4 = Frequently 5 = Repeatedly	NEVER	SELDOM	OCCASIONALLY	FREQUENTLY	REPEATEDLY
29)	I tell myself that I do not need drugs to make me feel good about myself.		1	2	3	4	5
30)	I ask for a change in my dose of methadone to help reduce my urges to use drugs.		1	2	3	4	5
31)	I avoid people who are heavy drug users.		1	2	3	4	5
32)	I take an active role in helping others to avoid drug use.		1	2	3	4	5
33)	I have strong feelings about how much my drug use has hurt the people I care about.		1	2	3	4	5
34)	I realize that, in order to obtain drugs, I have done things which go against my personal values.		1	2	3	4	5
35)	I have heard about serious medical problems which may result from drug use.		1	2	3	4	5
36)	I have someone who tries to share their personal experiences of drugs with me.		1	2	3	4	5
37)	I try to avoid keeping large sums of cash around which might tempt me to buy drugs.		1	2	3	4	5
38)	I have taken up other activities so that I have something else to do when I feel like using drugs.		1	2	3	4	5
39)	Other people in my daily life try to make me feel good when I'm not using drugs.		1	2	3	4	5
40)	I have someone I can count on to help me when I'm having problems with drug use.		1	2	3	4	5
41)	I get upset when I think about how things could be different if I had not developed a drug problem.		1	2	3	4	5
42)	I tell myself that if I try hard enough I can keep from using drugs.		1	2	3	4	5
43)	I try to get an increase in my methadone dose to help me deal with tensions which might otherwise lead me to use drugs.		1	2	3	4	5
44)	I seek out people who do not use drugs.		1	2	3	4	5

	1 = Never 2 = Seldom 3 = Occasionally 4 = Frequently 5 = Repeatedly	NEVER	SELDOM	OCCASIONALLY	FREQUENTLY	REPEATEDLY
45)	I seek out social situations where people respect the rights of others not to use drugs.	1	2	3	4	5
46)	I stop and think that my drug use is causing problems for other people.	1	2	3	4	5
47)	I feel ashamed or disappointed in myself when I depend on drugs.	1	2	3	4	5
48)	I have heard that drug use can keep me from finding other ways to solve problems.	1	2	3	4	5
49)	I stay away from places where I used to use drugs.	1	2	3	4	5
50)	I find that keeping myself busy reduces my craving for drugs.	1	2	3	4	5
51)	I spend time with people who reward me for not using drugs.	1	2	3	4	5
52)	Someone in my life tries to make me feel good when I don't use drugs.	1	2	3	4	5
53)	I feel sadness and grief when I think about someone close to me who died from drug-related causes.	1	2	3	4	5
54)	I make commitments to myself not to use drugs.	1	2	3	4	5
55)	I use different kinds of street drugs to help me avoid using other illicit drugs.	1	2	3	4	5
56)	I try to make friendships with non drug users.	1	2	3	4	5
57)	I see advertisements and/or news stories about how society is trying to help people not use drugs.	1	2	3	4	5
58)	I stop to think about how much crime is committed to maintain the habits of drug users.	1	2	3	4	5
59)	I think about the type of person I will be if I am in control of my drug use.	1	2	3	4	5
60)	I think about information that people have personally given me on the benefits of quitting drugs.	1	2	3	4	5

Appendix G

I.D.#_____ Date:_____

COPE

We are interested in how people respond when they confront difficult or stressful events in their lives. There are lots of ways to try to deal with stress. This questionnaire asks you to indicate what you generally do and feel, when *you* experience stressful events. Obviously, different events bring out somewhat different responses, but think about what you *usually* do when you are under a lot of stress.

Then respond to each of the following items by circling the appropriate number. Please try to respond to each item *separately in your mind from each other item.* Choose your answers thoughtfully, and make your answers as true FOR YOU as you can. Please answer *every* item. There are no "right" or "wrong" answers, so choose the most accurate answer for YOU-- not what you think "most people" would say or do. Indicate what YOU usually do when YOU experience a stressful event.

1 = I usually don't do this at all
2 = I usually do this a little bit
3 = I usually do this a medium amount
4 = I usually do this a lot

WHAT DO YOU USUALLY DO WHEN YOU ARE UNDER A LOT OF STRESS ?	NOT AT ALL	LITTLE BIT	MEDIUM	A LOT
1) I try to grow as a person as a result of the experience.	1	2	3	4
2) I turn to work or other substitute activities to take my mind off things.	1	2	3	4
3) I get upset and let my emotions out.	1	2	3	4
4) I try to get advice from someone about what to do.	1	2	3	4
5) I concentrate my efforts on doing something about it.	1	2	3	4
6) I say to myself "this isn't real."	1	2	3	4
7) I put my trust in God.	1	2	3	4
8) I admit to myself that I can't deal with it, and quit trying.	1	2	3	4
9) I restrain myself from doing anything too quickly.	1	2	3	4
10) I discuss my feelings with someone.	1	2	3	4
11) I use alcohol or drugs to make myself feel better.	1	2	3	4
12) I get used to the idea that it happened.	1	2	3	4
13) I talk to someone to find out more about the situation.	1	2	3	4
14) I keep myself from getting distracted by other thoughts or activities.	1	2	3	4

1 = I usually don't do this at all

2 = I usually do this a little bit

3 = I usually do this a medium amount

4 = I usually do this a lot

WHAT DO YOU USUALLY DO WHEN YOU ARE UNDER A LOT OF STRESS ?	NOT AT ALL	LITTLE BIT	MEDIUM	A LOT
15) I daydream about things other than this.	1	2	3	4
16) I get upset, and am really aware of it.	1	2	3	4
17) I seek God's help.	1	2	3	4
18) I make a plan of action.	1	2	3	4
19) I accept that this has happened and that it can't be changed.	1	2	3	4
20) I hold off doing anything about it until the situation permits.	1	2	3	4
21) I try to get emotional support from friends or relatives.	1	2	3	4
22) I just give up trying to reach my goal	1	2	3	4
23) I take additional action to try to get rid of the problem.	1	2	3	4
24) I try to lose myself for a while by drinking alcohol or taking drugs.	1	2	3	4
25) I refuse to believe that it has happened.	1	2	3	4
26) I let my feelings out.	1	2	3	4
27) I try to see it in a different light, to make it seem more positive.	1	2	3	4
28) I talk to someone who could do something concrete about the problem.	1	2	3	4
29) I sleep more than usual.	1	2	3	4
30) I try to come up with a strategy about what to do.	1	2	3	4
31) I focus on dealing with this problem, and if necessary let other things slide a little.	1	2	3	4
32) I get sympathy and understanding from someone.	1	2	3	4
33) I drink alcohol or take drugs, in order to think about it less.	1	2	3	4
34) I give up the attempt to get what I want.	1	2	3	4
35) I look for something good in what is happening.	1	2	3	4
36) I think about how I might best handle the problem.	1	2	3	4

1 = I usually don't do this at all

2 = I usually do this a little bit

3 = I usually do this a medium amount

4 = I usually do this a lot

WHAT DO YOU USUALLY DO WHEN YOU ARE UNDER A LOT OF STRESS ?	NOT AT ALL	A LITTLE BIT	MEDIUM	A LOT
37) I pretend that it hasn't really happened.	1	2	3	4
38) I make sure not to make matters worse by acting too soon.	1	2	3	4
39) I try hard to prevent other things from interfering with my efforts at dealing with this.	1	2	3	4
40) I go to movies or watch TV, to think about it less.	1	2	3	4
41) I accept the reality of the fact that it happened.	1	2	3	4
42) I ask people who have had similar experiences what they did.	1	2	3	4
43) I feel a lot of emotional distress and I find myself expressing those feelings a lot.	1	2	3	4
44) I take direct action to get around the problem.	1	2	3	4
45) I try to find comfort in my religion.	1	2	3	4
46) I force myself to wait for the right time to do something.	1	2	3	4
47) I reduce the amount of effort I'm putting into solving the problem.	1	2	3	4
48) I talk to someone about how I feel.	1	2	3	4
49) I use alcohol or drugs to help me get through it.	1	2	3	4
50) I learn to live with it.	1	2	3	4
51) I put aside other activities in order to concentrate on this.	1	2	3	4
52) I think hard about what steps to take.	1	2	3	4
53) I act as though it hasn't even happened.	1	2	3	4
54) I do what has to be done, one step at a time.	1	2	3	4
55) I learn something from the experience.	1	2	3	4
56) I pray more than usual.	1	2	3	4

Appendix H

I.D.#_____ Date:_____

Demographic Data

Please provide the following information in the spaces provided:

1. **Sex** (circle one): 1 = Male 2 = Female

2. **Age:** _____years old

3. **Race** (circle one):
   1 = black 2 = white 3 = Hispanic/Latino
   4 = Asian/Pacific Islander 5 = Native American 6 = Other (specify):_____

4. **Marital Status** (circle one):
   1 = single (never married) 2 = married (including common law) 3 = divorced
   4 = separated 5 = living with sex partner 6 = widowed

5. **Which of the following best describes your work situation today?**(circle one)
   1 = Steady full-time work 2 = Steady part-time work 3 = Occasional or seasonal work
   4 = Unemployed 5 = Homemaker 6 = Student
   7 = Receiving disability payments

6. **What is the highest grade you completed in school?** _____

7. **Do you have a G.E.D. or high school diploma?**(circle one) 1 = yes 2 = no

8. **When did you begin treatment at this program?** _____ / _____
   (this admission only) MONTH YEAR

9. **Is your treatment here court-ordered?**(circle one) 1 = yes 2 = no

10. **At what age did you start using drugs ?** _____ years old

11. **At what age did you begin using heroin or other opiates regularly ?** _____ years old

12. How many take-home bottles of medication do you receive per week?(circle one)

0 1 2 3 4 5 6

13. How much longer do you expect to remain on methadone maintenance?(check one)

_____ 3 months or less
_____ 6 months or less
_____ 1 year or less
_____ 2 years or less
_____ 5 years or less
_____ 10 years or less
_____ more than 10 years.
_____ I can't see myself ever being off methadone.
_____ I plan to stay on methadone indefinitely.

14) On average, how often do you meet with your counselor to have a counseling session?(check one)

_____ Less than once every 2 months.
_____ Once every 2 months.
_____ Once a month.
_____ Twice a month
_____ Once a week.
_____ More than once a week.

15) How long is your average counseling session? _____minutes

16) How often would you <u>like</u> to meet with your counselor to have a counseling session? _____ times per month
(enter zero if you would prefer not to meet with your counselor)

17) How long would you <u>like</u> your counseling sessions to last? _____minutes

18) How often do you participate in group therapy? _____ times per month
(enter zero if you do not attend)

19) How often do you participate in individual psychotherapy? _____ times per month
(enter zero if you are not in psychotherapy)

20) How often do you attend AA or NA meetings? _____ times per month
(enter zero if you do not attend)

APPROVED: 04/08/93

HU

Hahnemann University

CONSENT TO PARTICIPATE IN AN INVESTIGATIONAL RESEARCH PROTOCOL

1. **Your Name:** _____

2. **Title of Research:** *An analysis of stages and processes of change among opiate addicts in methadone maintenance treatment - Study 1*

3. **Purpose of Research:** The purpose of the research project in which you have been asked to participate is to provide information about the process of recovery from drug addiction among individuals in methadone maintenance treatment. We are studying aspects of how people get off drugs, their views of drug use and the strategies they may use in the course of recovery. It is hoped that such research will eventually help to make substance abuse treatment more effective. You have been asked to participate in this study because you are currently in methadone maintenance treatment. Participation in this study will last for a total of about 45 minutes.

4. **Procedures and Duration:** Your participation will involve the following (experimental procedures are underlined, like this):

   If you choose to participate, you will be asked to sign up for one of the administration times listed on the sign-up sheet. At the date and time for which you sign up, you will report to the research office at the clinic. A research assistant will hand you a series of forms which will require approximately 20 to 30 minutes to complete. The researchers will collect the forms when you have finished and pay you $10.00 in cash for your participation.

   Should you choose to participate, the information you provide will remain completely anonymous. Your name will not appear on any of the questionnaires you fill out, nor will the questionnaires provide any means for identifying you. We are insuring anonymity in order to insure that the information you provide is as honest and accurate as possible.

5. **Risks and Discomforts:** The only risks or discomforts associated with being in this study are that you may feel uncomfortable thinking about or answering questions about drugs and drug use.

6. **Benefits:** The only possible direct benefits of participation are that you may gain a greater understanding of your own drug use as a result of thinking about and responding to items on the questionnaires.

8. **Reasons For Removal from the Study Before it is Over:**

   Your participation may be stopped before the end of the study for any of the following reasons:

   • if an investigator determines that you are unable to read or comprehend the items on the questionnaires.

• if all or part of the study is stopped for any reason by the sponsor, the University, or by government agencies.

9. **Refusal or Withdrawal from Participation in the Study:**

   You may refuse to participate in the study or change your mind about continuing to participate at any time and your decision will in no way affect your treatment.

10. **In Case of Questions:** If you should have any questions, about this research study, you should contact Mark Belding, at (609) 227-5254. If you believe you have been injured in any way by this research, you should also contact the Hahnemann University Research Administration Office at (215) 448-3453.

11. **Consent to use Research Results and Confidentiality of Records:** As a participant in this research study, you are giving permission for Hahnemann University to keep, preserve, publish, use, or dispose of the results of the research study. In any publication of the research results your identity will be kept confidential. There is a possibility that records which identify you may be inspected by the research sponsor, the Food and Drug Administration, or other agencies as required by law.

12. **Participant Certification:** You hereby certify that you are between 18 and 60 years of age. If you are under 18 or over 60, do not sign this consent form. Please tell the person who gave you this form that you are not eligible to participate in the study.

BY SIGNING THIS FORM, YOU ACKNOWLEDGE THAT YOU HAVE BEEN INFORMED OF THE REASONS FOR THIS STUDY, AND THAT THE STUDY HAS BEEN CAREFULLY EXPLAINED TO YOU. PLEASE BE CERTAIN THAT ALL OF YOUR QUESTIONS HAVE BEEN FULLY ANSWERED BEFORE SIGNING. REMEMBER, READ THIS CONSENT FORM CAREFULLY, AND IF YOU WISH, YOU WILL BE PROVIDED WITH A COPY.

DATE	PARTICIPANT
WITNESS	INVESTIGATOR OR DESIGNEE

Appendix J

APPROVED: 04/08/93

HU

Hahnemann University

CONSENT TO PARTICIPATE IN AN INVESTIGATIONAL RESEARCH PROTOCOL

1. **Your Name:** _____

2. **Title of Research:** *An analysis of stages and processes of change among opiate addicts in methadone maintenance treatment - Study 2*

3. **Purpose of Research:** The purpose of the research project in which you have been asked to participate is to provide information about the process of recovery from drug addiction among individuals in methadone maintenance treatment. We are studying aspects of how people get off drugs, their views of drug use and the strategies they may use in the course of recovery. It is hoped that such research will eventually help to make substance abuse treatment more effective. You have been asked to participate in this study because you are currently in methadone maintenance treatment. Participation in this study will last for a total of about 45 minutes.

4. **Procedures and Duration:** Your participation will involve the following (experimental procedures are underlined, like this):

   If you choose to participate, you will be asked to sign up for one of the administration times listed on the sign-up sheet. At the date and time for which you sign up, you will report to the research office at the clinic. A research assistant will hand you a series of forms which will require approximately 30 minutes to complete. The research assistant will collect the forms when you have finished and pay you $10.00 in cash for your participation.

   Should you choose to participate, the information you provide will remain completely confidential and will not be available to your counselor or to any other members of the clinical staff. Your name will not appear at any point on the forms which you complete. Instead, a research assistant will assign a number to your materials so that the information you provide may be connected with other research data. No one besides the research assistants will know what number you have been assigned. We are insuring confidentiality in order to insure that the information you provide is as honest and accurate as possible.

5. **Risks and Discomforts:** The only risks or discomforts associated with being in this study are that you may feel uncomfortable thinking about or answering questions about drugs and drug use.

6. **Benefits:** The only possible direct benefits of participation are that you may gain a greater understanding of your own drug use as a result of thinking about and responding to items on the questionnaires.

8. **Reasons For Removal from the Study Before it is Over:**

   Your participation may be stopped before the end of the study for any of the following reasons:

• if a research assistant determines that you are unable to read or comprehend the items on the questionnaires.

• if all or part of the study is stopped for any reason by the sponsor, the University, or by government agencies.

9. **Refusal or Withdrawal from Participation in the Study:**

   You may refuse to participate in the study or change your mind about continuing to participate at any time and your decision will in no way affect your treatment.

10. **In Case of Questions:** If you should have any questions, about this research study, you should contact Mark Belding, at (609) 227-5254 or speak to one of the research assistants administering the questionnaires. If you believe you have been injured in any way by this research, you should also contact Martin Iguchi, Ph.D. at (215) 762-1701 and the Hahnemann University Research Administration Office at (215) 762-3453.

11. **Consent to use Research Results and Confidentiality of Records:** As a participant in this research study, you are giving permission for Hahnemann University to keep, preserve, publish, use, or dispose of the results of the research study. In any publication of the research results your identity will be kept confidential. There is a possibility that records which identify you may be inspected by the research sponsor, the Food and Drug Administration, or other agencies as required by law.

12. **Participant Certification:** You hereby certify that you are between 18 and 60 years of age. If you are under 18 or over 60, do not sign this consent form. Please tell the person who gave you this form that you are not eligible to participate in the study.

BY SIGNING THIS FORM, YOU ACKNOWLEDGE THAT YOU HAVE BEEN INFORMED OF THE REASONS FOR THIS STUDY, AND THAT THE STUDY HAS BEEN CAREFULLY EXPLAINED TO YOU. PLEASE BE CERTAIN THAT ALL OF YOUR QUESTIONS HAVE BEEN FULLY ANSWERED BEFORE SIGNING. REMEMBER, READ THIS CONSENT FORM CAREFULLY, AND IF YOU WISH, YOU WILL BE PROVIDED WITH A COPY.

DATE	PARTICIPANT
WITNESS	INVESTIGATOR OR DESIGNEE

Appendix K

Treatment of Missing Data

URICA

Values for missing data points were estimated by using group means (Tabachnick & Fidell, 1989). Mean scores on each variable were calculated for subjects in each of the five stages of change as classified according to the algorithm. These mean scores were substituted for the missing data points. So, for example, if a subject who had been classified in the Contemplation stage failed to provide a response to Item 25, the mean score for Contemplators on that item was substituted for the missing data. This method of data substitution is less conservative than substituting the mean for all subjects on a particular item; however, if there were no relationship between stage categories and URICA scores, this method of substitution would be expected to result in no improvement in model fit. There was a total of 15 missing data points. The maximum number of missing data points for any one variable was 4. For the final 12 items used, there were 7 missing data points and the maximum number of missing data points for any one variable was 2.

Processes of Change

As with the confirmation of the URICA, values for missing data points were estimated by using group means. Mean scores on each item were calculated for subjects in each of the five stages of change as classified according to the algorithm. These values were substituted for missing data point in accordance with the subject's algorithm stage classification. There was a total of 90 missing data points. The number of missing data points for any one item varied from 0 to 7. For the 25 items used in final

version of the scales, there were 49 missing data points with a range of 0 to 6 points per variable.

COPE

Missing COPE data were handled in the same manner as missing data on the URICA and Processes of Change measures. Mean scores on each COPE item were calculated for subjects in each of the five stages of change as classified according to the algorithm. These values were substituted for missing data points in accordance with the subject's algorithm stage classification. There was a total of 97 missing data points. The number of missing data points for any one item varied from 0 to 6. For the 36 items in the final version of the measure, there were 65 missing data points with a range of 0 to 5.

Urine Screen Data - Study 2

The amount of time out of treatment varied from one week to two months. This resulted in a range of 3 to 28 missing urine screen results. Missing data were replaced with a subject's most recent urine screen results prior to leaving treatment. One subject, for example, left treatment 12 days prior to the end of his three-month follow-up period. Had he remained in treatment during that time, he would have provided another eight urine specimens. The results from his last eight urine screens were substituted for the missing data. All missing data were handled in this way, resulting in the substitution of a total of 72 urine results of which 70 were positive for illicit drugs by interpolation. This method of substitution assumes a great deal of stability in drug using behavior. However, each subject who left treatment was a chronic user of illicit drugs at the time and none of the subjects was known to have entered treatment

elsewhere. It is therefore highly likely that each of these subjects continued to use illicit drugs regularly.

Table K.1
Number of days out of treatment and number of interpolated urine screen results for those subjects with missing follow-up data.

	Reason for missing data	No. of days out of Tx during 3 mo. follow up.	No. of Missing Data Points	No. of interpolated "dirty" urine screen results.
Subject 1	Left treatment A.M.A.	29	15	15
Subject 2	"	19	8	7
Subject 3	"	12	4	3
Subject 4	Administrative detoxification for chronic drug use	60	28	28
Subject 5	"	4	3	3
Subject 6	Administrative detoxification for disruptive behavior	9	5	5
Subject 7	Two periods of incarceration	14 days total	11	11

Appendix L

URICA

Table L.1
URICA subscale item content with factor loadings of items included in the final model.

	Item	Factor Loading
Precontemplation		
5)	I'm not the problem one. It doesn't make much sense for me to be here.	.53
11)	Being here is pretty much of a waste of time for me because the problem doesn't have to do with me.	.72
13)	I guess I have faults, but there's nothing that I really need to change.	.64
14)*	Besides taking methadone, I can't think of anything I really need to do about my problem.	.60
1)	As far as I'm concerned, I don't have any problems that need changing.	**
23)	I may be part of the problem, but I don't really think I am.	**
24)*	I no longer have a problem, so there is very little for me to work on here.	**
26)	All this talk about psychology is boring. Why can't people just forget about their problems?	**
29)	I have worries but so does the next guy. Why spend time thinking about them?	**
31)	I would rather cope with my faults than try to change them.	**
Contemplation		
8)	I've been thinking that I might want to change something about myself.	.60
12)	I'm hoping this place will help me to better understand myself.	.67
19)	I wish I had more ideas on how to solve my problem.	.65
34)	I hope that someone here will have some good advice for me.	.62
2)	I think I might be ready for some self-improvement.	**
4)	It might be worthwhile to work on my problem.	**
15)	I have a problem and I really think I should work on it.	**
21)	Maybe this place will be able to help me.	**
Action		
7)	I am finally doing some work on my problem.	.63
10)	At times my problem is difficult, but I'm working on it.	.54
17)	Even though I'm not always successful in changing, I am at least working on my problem.	.71
33)	I am really working hard to change.	.61
3)	I am doing something about the problems that had been bothering me.	**
20)	I have started working on my problems but I would like help.	**
25)	Anyone can talk about changing; I'm actually doing something about it.	**
30)	I am actively working on my problem.	**

* Items generated by the author for use with methadone maintenance patients.
** Items eliminated from final model.

	Item	Factor Loading
Maintenance		
6)	It worries me that I might slip back on a problem I have already changed, so I am here to seek help.	***
18)	I thought once I had resolved the problem I would be free of it, but sometimes I still find myself struggling with it.	***
22)	I may need a boost right now to help me maintain the changes I've already made.	***
27)	I'm here to prevent myself from having a relapse of my problem.	***
9)	I have been successful in working on my problem but I'm not sure I can keep up the effort on my own.	
16)	I'm not following through with what I had already changed as well as I had hoped, and I'm here to prevent a relapse of the problem.	
28)	It is frustrating, but I feel I might be having a recurrence of a problem I thought I had resolved.	
32)	After all I had done to try and change my problem, every now and again it comes back to haunt me.	

*** The Maintenance scale failed to be validated with this population and was not included in the final model. These are the four highest loading Maintenance items from the initial model.

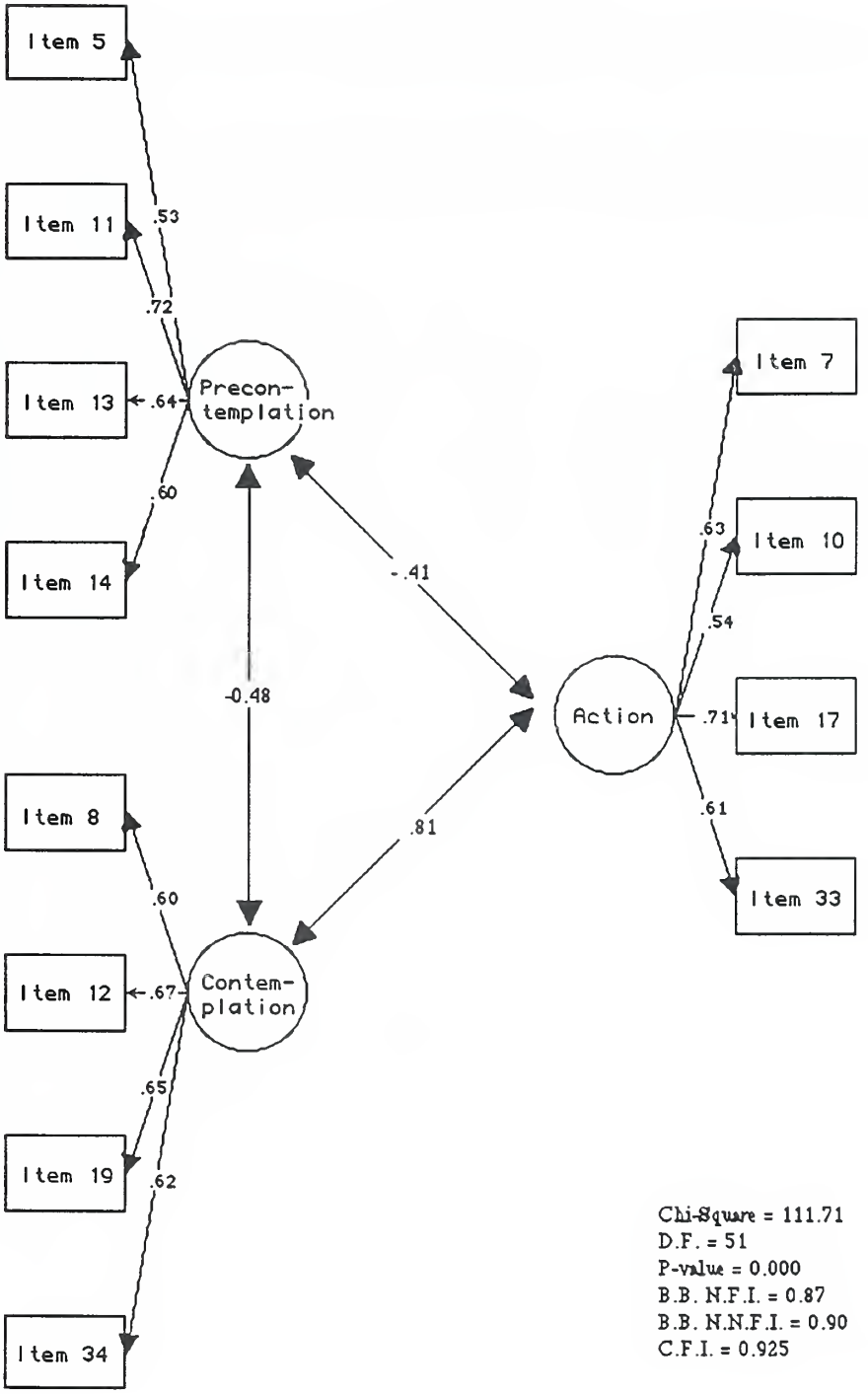

Figure L.1
Path diagram of URICA confirmatory factor analysis, maximum likelihood solution, final model.

Appendix M

Factor Correlations - Process of Change Scale
Initial 12 Factor Model

	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12
F1	1.00											
F2	.94	1.00										
F3	.99	.92	1.00									
F4	1.00	1.00	.99	1.00								
F5	.84	.60	.73	.62	1.00							
F6	.68	.59	.66	.58	.71	1.00						
F7	.67	.48	.62	.53	.67	.91	1.00					
F8	.65	.50	.59	.46	.84	.72	.70	1.00				
F9	.72	.51	.58	.47	.82	.67	.66	.95	1.00			
F10	.72	.43	.57	.48	.79	.64	.58	.80	.93	1.00		
F11	.90	.61	.81	.62	.78	.80	.68	.78	.88	.93	1.00	
F12	.04	.37	.09	.38	-.17	.03	-.07	-.14	-.02	-.03	-.04	1.00

F1 Consciousness Raising

F2 Dramatic Relief

F3 Environmental Reevaluation

F4 Self Reevaluation

F5 Self Liberation

F6 Reinforcement Management

F7 Helping Relationships

F8 Counterconditioning

F9 Stimulus Control

F10 Interpersonal Stimulus Control

F11 Social Liberation

F12 Medication

Appendix N

Processes of Change

Table N.1
Processes of Change subscale item content with factor loadings of the 25 items included in the final four-factor model.

	Item	Factor Loading
Reevaluation		
	Consciousness Raising	
24)	I have heard that drug use may result in severe mood swings and depression.	.59
12)	Information from the media (magazines, newspaper, radio, T.V.) about drugs seems to catch my eye.	*
35)	I have heard about serious medical problems which may result from drug use.	*
48)	I have heard that drug use can keep me from finding other ways to solve problems.	*
60)	I think about information that people have personally given me on the benefits of quitting drugs.	*
	Dramatic Relief	
41)	I get upset when I think about how things could be different if I had not developed a drug problem.	.67
5)	I am frightened by some of the situations I have found myself in as a result of my involvement with drugs.	*
17)	I feel frightened by the strength of my urges to use drugs.	*
28)	Dramatic presentations of the dangers of drug use affect me emotionally.	*
53)	I feel sadness and grief when I think about someone close to me who died from drug-related causes.	*
	Environmental Reevaluation	
22)	I think about the ways in which the people around me would be better off without my drug abuse.	.63
33)	I have strong feelings about how much my drug use has hurt the people I care about.	.71
46)	I stop and think that my drug use is causing problems for other people.	.63
10)	I stop to think about how my drug use is hurting people around me.	*
58)	I stop to think about how much crime is committed to maintain the habits of drug users.	*
	Self Reevaluation	
47)	I feel ashamed or disappointed in myself when I depend on drugs.	.66
59)	I think about the type of person I will be if I am in control of my drug use.	.58
11)	I am ashamed of some of my behaviors while using drugs.	*
23)	I get upset with myself when I think about my drug problem.	*
34)	I realize that, in order to obtain drugs, I have done things which go against my personal values.	*

* Items dropped from the final model.

	Item	Factor Loading
Self Liberation		
	Self Liberation	
29)	I tell myself that I do not need drugs to make me feel good about myself.	.60
42)	I tell myself that if I try hard enough I can keep from using drugs.	.65
54)	I make commitments to myself not to use drugs.	.72
6)	I tell myself that I can choose to use drugs or not to use drugs.	*
18)	I make commitments to myself to not turn to drugs at times then I am feeling anxious or unsure of myself.	*
Reinforcing Relationships		
	Reinforcement Management	
15)	I notice that I am rewarded by others when I don't use drugs.	.63
39)	Other people in my daily life try to make me feel good when I'm not using drugs.	.75
51)	I spend time with people who reward me for not using drugs.	.69
52)	Someone in my life tries to make me feel good when I don't use drugs.	.52
3)	I do something nice for myself when I don't give in to my urge to use drugs.	*
	Helping Relationships	
16)	I have found a supportive group of people with whom I can talk about my drug problem.	.61
27)	I have someone who listens when I need to talk about my drug use.	.62
40)	I have someone I can count on to help me when I'm having problems with drug use.	.71
4)	Someone in my life lets me know about how my drug use is affecting me personally.	*
36)	I have someone who tries to share their personal experiences of drugs with me.	*

* Items dropped from final model.

	Item	Factor Loading
Behavioral Processes		
	Counterconditioning	
26)	When I am tempted to use drugs, I try to distract myself by doing something else.	.68
38)	I have taken up other activities so that I have something else to do when I feel like using drugs.	.71
50)	I find that keeping myself busy reduces my craving for drugs.	.65
2)	I find it helpful to do something physically active to keep from using drugs.	*
14)	I find other ways to relax myself instead of using drugs to relieve stress and tension.	*
	Stimulus Control	
25)	I avoid situations that encourage me to use drugs.	.80
49)	I stay away from places where I used to use drugs.	.72
1)	I keep things around my home or work that remind me not to use drugs.	*
13)	I remove things from my home or work that remind my of using drugs.	*
37)	I try to avoid keeping large sums of cash around which might tempt me to buy drugs.	*
	Interpersonal Stimulus Control	
20)	I avoid people who encourage drug use.	.71
31)	I avoid people who are heavy drug users.	.67
56)	I try to make friendships with non drug users.	.64
8)	I change personal relationships which contribute to my drug use.	*
44)	I seek out people who do not use drugs.	*
The remaining two hypothesized factors were not supported by confirmatory procedures.		
F11	Social Liberation	
9)	I see signs in some public places trying to help people not use drugs.	
21)	I notice that people who are quitting drugs are speaking out against peer pressure to use drugs.	
32)	I take an active role in helping others to avoid drug use.	
45)	I seek out social situations where people respect the rights of others not to use drugs.	
57)	I see advertisements and/or news stories about how society is trying to help people not use drugs.	
F12	Medication	
7)	I use prescribed medications (besides methadone) to help me deal with anxiety or depression which might otherwise lead me to use drugs.	
19)	I drink to help me not use drugs.	
30)	I ask for a change in my dose of methadone to help reduce my urges to use drugs.	
43)	I try to get an increase in my methadone dose to help me deal with tensions which might otherwise lead me to use drugs.	
55)	I use different kinds of street drugs to help me avoid using other illicit drugs.	

* Items dropped from final model.

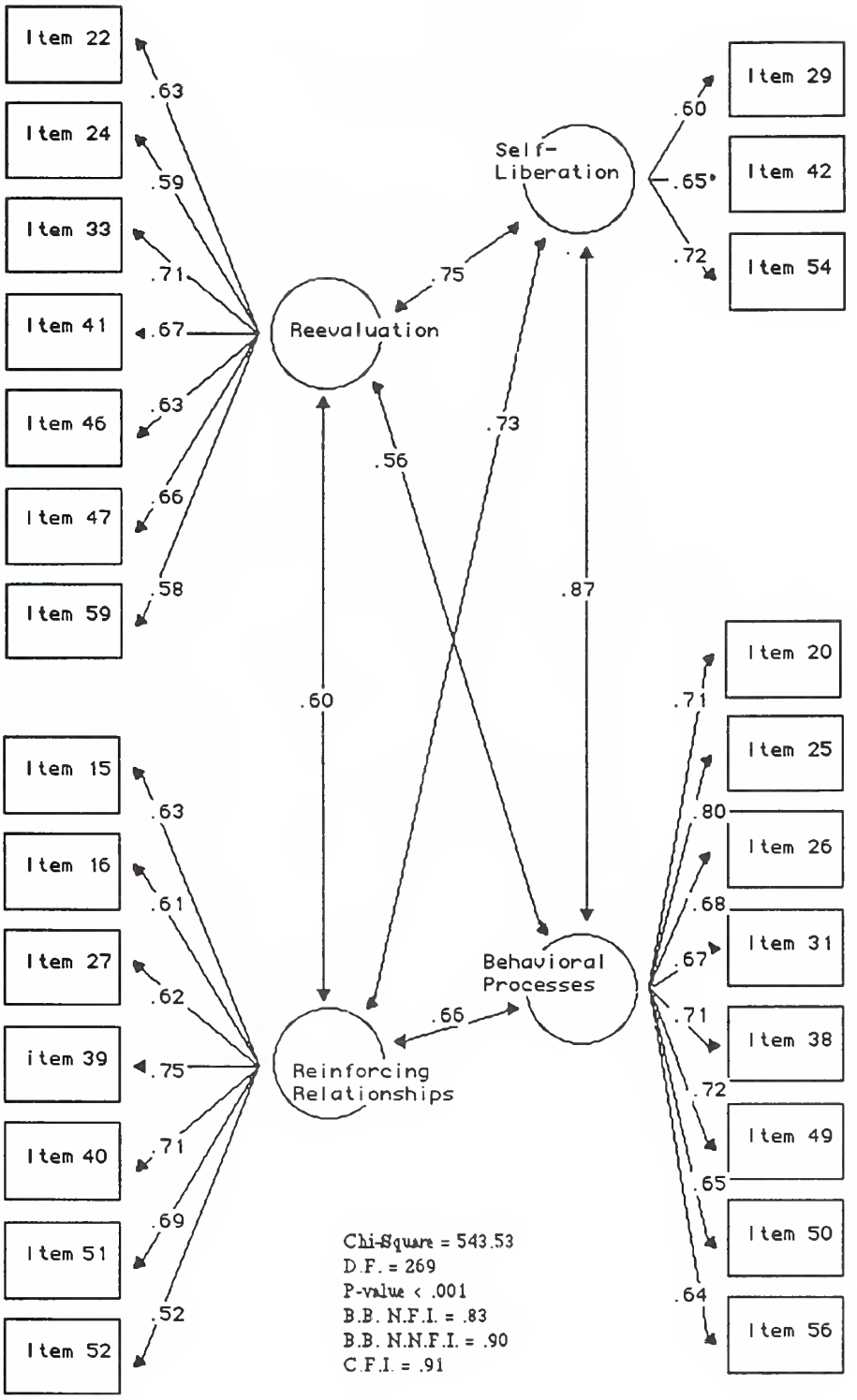

Figure N.1
Path diagram of Processes of Change Questionnaire confirmatory factor analysis, maximum likelihood solution, final model.

Appendix O

Factor Correlations - COPE
Initial 14 Factor Model

	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13	F14
F1	1.00													
F2	.96	1.00												
F3	.95	1.00	1.00											
F4	.74	.70	.68	1.00										
F5	.74	.82	.73	.82	1.00									
F6	.76	.87	.77	.64	.75	1.00								
F7	.46	.44	.37	.43	.44	.37	1.00							
F8	.79	.70	.60	.52	.64	.44	.20	1.00						
F9	.23	.10	.01	.18	.31	.62	.32	.15	1.00					
F10	.32	.62	.47	.51	.63	.69	.37	.45	.48	1.00				
F11	-.23	-.23	-.37	-.06	-.14	.12	.09	-.11	.72	.24	1.00			
F12	.06	.05	-.17	.07	.03	.38	.26	-.08	.68	.28	.78	1.00		
F13	.68	.78	.67	.63	.66	.98	.34	.59	.44	.58	.24	.40	1.00	
F14	-.28	-.29	-.28	-.24	-.17	-.02	-.06	.05	.43	.16	.54	.36	.07	1.00

F1 Positive Reinterpretation and Growth
F2 Active Coping
F3 Planning
F4 Seeking of Social Support for Emotional Reasons
F5 Seeking of Social Support for Instrumental Reasons
F6 Suppression of Competing Activities
F7 Turning to Religion
F8 Acceptance
F9 Mental Disengagement
F10 Focus on and Venting Emotions
F11 Behavioral Disengagement
F12 Denial
F13 Restraint Coping
F14 Alcohol/Drug Use

Appendix P

COPE

Table P.1
COPE subscale item content with factor loadings of items included in the final model, maximum likelihood solution. The model specified that each item could load on only one factor; factors could correlate with each other; all other paths were fixed at zero.

	Item	Factor Loading
F1	**Positive Reinterpretation and Growth**	
1)	I try to grow as a person as a result of the experience.	*
27)	I try to see it in a different light, to make it seem more positive.	*
35)	I look for something good in what is happening.	*
55)	I learn something from the experience.	*
F2	**Active Coping**	
5)	I concentrate my efforts on doing something about it.	*
23)	I take additional action to try to get rid of the problem.	*
44)	I take direct action to get around the problem.	*
54)	I do what has to be done, one step at a time.	*
F3	**Planning**	
18)	I make a plan of action.	.63
30)	I try to come up with a strategy about what to do.	.71
36)	I think about how I might best handle the problem.	.71
52)	I think hard about what steps to take.	.71
F4	**Seeking of Social Support for Emotional Reasons**	
10)	I discuss my feelings with someone.	.57
21)	I try to get emotional support from friends or relatives.	.69
32)	I get sympathy and understanding from someone.	.60
48)	I talk to someone about how I feel.	.71
F5	**Seeking of Social Support for Instrumental Reasons**	
4)	I try to get advice from someone about what to do.	.61
13)	I talk to someone to find out more about the situation.	.69
28)	I talk to someone who could do something concrete about the problem.	.70
42)	I ask people who have had similar experiences what they did.	.60
F6	**Suppression of Competing Activities**	
14)	I keep myself from getting distracted by other thoughts or activities.	.44
31)	I focus on dealing with this problem, and if necessary let other things slide a little.	.54
39)	I try hard to prevent other things from interfering with my efforts at dealing with this.	.48
51)	I put aside other activities in order to concentrate on this.	.41

* These scales failed to be confirmed and were not included in the final model.

	Item	Factor Loading
F7	**Religion**	
7)	I put my trust in God.	.80
17)	I seek God's help.	.87
45)	I try to find comfort in my religion.	.78
56)	I pray more than usual.	.75
F8	**Acceptance**	
12)	I get used to the idea that it happened.	*
19)	I accept that this has happened and that it can't be changed.	*
41)	I accept the reality of the fact that it happened.	*
50)	I learn to live with it.	*
F9	**Mental disengagement**	
2)	I turn to work or other substitute activities to take my mind off things.	*
15)	I daydream about things other than this.	*
29)	I sleep more than usual.	*
40)	I go to movies or watch TV, to think about it less.	*
F10	**Focus on and Venting of Emotions**	
3)	I get upset and let my emotions out.	.51
16)	I get upset, and am really aware of it.	.56
26)	I let my feelings out.	.45
43)	I feel a lot of emotional distress and I find myself expressing those feelings a lot.	.66
F11	**Behavioral Disengagement**	
8)	I admit to myself that I can't deal with it, and quit trying.	.61
22)	I just give up trying to reach my goal	.64
34)	I give up the attempt to get what I want.	.52
47)	I reduce the amount of effort I'm putting into solving the problem.	.58
F12	**Denial**	
6)	I say to myself "this isn't real."	.52
25)	I refuse to believe that it has happened.	.64
37)	I pretend that it hasn't really happened.	.66
53)	I act as though it hasn't even happened.	.60
F13	**Restraint Coping**	
9)	I restrain myself from doing anything too quickly.	*
20)	I hold off doing anything about it until the situation permits.	*
46)	I force myself to wait for the right time to do something.	*
38)	I make sure not to make matters worse by acting too soon.	*

* These scales failed to be confirmed and were not included in the final model.

	Item	Factor Loading
F14	**Alcohol/Drug Use**	
11)	I use alcohol or drugs to make myself feel better.	.73
24)	I try to lose myself for a while by drinking alcohol or taking drugs.	.81
33)	I drink alcohol or take drugs, in order to think about it less.	.78
49)	I use alcohol or drugs to help me get through it.	.84

Table L.2
Correlations among the nine confirmed COPE factors in the final model..

	Planning	Emot. Support	Instrm. Support	Sup-pression	Religion	Vent Emot.	Behav. Diseng.	Denial	Alcohol/ Drug
Plan-ning	1.00								
Emot. Support	.69	1.00							
Instrm. Support	.74	.82	1.00						
Sup-pression	.78	.63	.74	1.00					
Religion	.38	.42	.44	.35	1.00				
Vent Emot.	.48	.52	.63	.71	.37	1.00			
Behav. Diseng.	-.37	-.06	-.14	.12	.09	.22	1.00		
Denial	-.17	.07	.03	.38	.26	.27	.78	1.00	
Alcohol/ Drug	-.28	-.24	-.17	-.01	-.06	.15	.54	.37	1.00

Appendix Q

Demographic Differences: Clinic 1 vs. Clinics 2-4

A MANOVA was performed to contrast the Clinic 1 sub-sample with the remaining subjects on the following continuous demographic variables: age, education level, months in treatment at current clinic, number of bottles of take-home medication received per week, years of drug use prior to the current treatment episode, and years of opiate use prior to the current treatment episode. The MANOVA was significant, Wilks Lambda (6, 258) = .92, $p < .01$). Univariate F-tests were significant for age and months in treatment only. These differences are listed below in Table Q.1. There were no significant differences across locations in level of education, years of drug use, years of opiate use, or average number of take-homes.

Table Q.1
Comparison of subjects' average age and average amount of time in treatment at current clinic: Clinic 1 vs. Clinics 2-4.

Demographic Variable	Clinic 1 (n = 42)	Clinics 2-4 (n = 233)	F test
	M (SD)	M (SD)	F Significance
Age (years)	35.83 (7.43)	40.01 (7.16)	F(1,273) = 12.00 P < .001
Months in Treatment	17.76 (37.64)	51.33 (60.40)	F(1,267) = 12.08 p < .001

The results indicate that, on average, Clinic 1 subjects were approximately four years younger than subjects at the other clinics and that they had spent less than half as much time in treatment at their current clinic. The large standard deviations reflect great variability among treatment tenures in both samples. In the Clinic 1 sample, time in treatment varied from zero months to approximately 13 years. Subjects at the other

clinics reported treatment tenures which varied from one month to approximately 24 years. In light of this variability, median figures may provide more representative indices of time in treatment in the two samples. The median at Clinic 1 was 3.39 months vs. 29.19 months at the other clinics. Thus, most of the Clinic 1 subjects had entered treatment within a few months prior to the administration of the questionnaires. While most of the other subjects had been in treatment at their clinics for several years.

Multiple chi-square tests were conducted using Bonferroni's adjustment to contrast Clinic 1 subjects with the subjects from the other three clinics on the following categorical demographic variables: sex, ethnic background, employment status, marital status and G.E.D. status. The samples differed significantly from each other only on subjects' ethnic background, $\chi^2(3, 275) = 17.14$, $p < .001$. Table Q.2 shows the numbers of subjects in each ethnic category for both samples. The table illustrates that relative to the rest of the sample, white patients were over-represented at Clinic 1 while black patients were underrepresented. 79% of Clinic 1 subjects were white while only 10% were black. The rest of the Study 1 sample was 48% white and 41% black.

Table Q.2
Numbers of subjects from each of four different ethnic background groups: Clinic 1 vs. Clinics 2-4.

Ethnic Background	Clinic 1	Clinics 2-4
	observed value (expected value)	observed value (expected value)
white	33 (22.1)	112 (122.9)
black	4 (15.3)	96 (84.7)
Hispanic	5 (4.0)	21 (22.0)
other	0 (.6)	4 (3.4)

To determine whether Clinic 1 subjects differed from the rest of the sample with regard to their reported recent drug use, the samples were compared on reported use of the various classes of drugs: opiates, cocaine, benzodiazepines, marijuana/hashish and other drugs. The MANOVA was not significant, Wilks Lambda (5, 247) = .96, $p > .05$, indicating no significant differences in reported recent drug use between the Clinic 1 subjects and the rest of the sample.

Appendix R

APPROVED: 04/08/93

HU

Hahnemann University

CONSENT TO PARTICIPATE IN AN INVESTIGATIONAL RESEARCH PROTOCOL

1. **Your Name:** _____

2. **Title of Research:** *An analysis of stages and processes of change among opiate addicts in methadone maintenance treatment - Study 3*

3. **Purpose of Research:** The purpose of the research project in which you have been asked to participate is to provide additional information about the process of recovery from drug addiction and about the usefulness of the questionnaires you filled out earlier. We are studying aspects of how people get off drugs, their views of drug use and the strategies they may use in the course of recovery. It is hoped that such research will eventually help to make substance abuse treatment more effective. You have been asked to participate in this study because you completed the questionnaires which made up study 1. Participation in this study will last for a total of about 90 minutes.

4. **Procedures and Duration:** Your participation will involve the following (experimental procedures are underlined, like this):

   If you choose to participate, you will be asked to sign up for a time to speak with Mark Belding who is one of the investigators in this study. Mr. Belding will interview you for a period of about 90 minutes regarding aspects of your history, your views of drug use, the process of recovery, and your responses to the questionnaires in study 1. At the end of the interview, you will be paid $15.00 in cash for your participation.

   Should you choose to participate, the information you provide will not be available to your counselor or to other members of the clinical staff. By agreeing to discuss your responses to the questionnaires on Study 1, you are agreeing to make this information available to Mr. Belding who is the clinical director of A.R.T. We are insuring confidentiality from other clinical staff members in order to insure that the information you provide has no impact on your treatment at A.R.T. since your honest and accurate answers are essential to the study. Your decision about whether to participate will not affect your treatment at A.R.T.

5. **Risks and Discomforts:** The risks and/or discomforts associated with being in this study include the following:

   You may feel uncomfortable thinking about or answering personal questions about drugs and drug use. However, you may withdraw from the study at any point and you may refuse to answer any questions

   Since the investigator in this study is also the clinical director of A.R.T., there is a possibility that the information you provide could in some way influence administrative decisions about your treatment here; however, Mr. Belding will make every effort to insure that this does not happen and that your confidentiality is protected.

6. **Benefits:** The only possible direct benefits of participation are that you may gain a greater understanding of your own drug use as a result of participating in the interview.

8. **Reasons For Removal from the Study Before it is Over:**

   Your participation may be stopped before the end of the study for any of the following reasons:

   • if all or part of the study is stopped for any reason by the sponsor, the University, or by government agencies.

9. **Refusal or Withdrawal from Participation in the Study:**

   You may refuse to participate in the study or change your mind about continuing to participate at any time and your decision will in no way affect your treatment.

10. **In Case of Questions:** If you should have any questions about this research study, you should contact Mark Belding or Martin Iguchi, Ph.D., at (609) 227-5254. You may also reach Dr. Iguchi at Hahnemann University at (215) 762-1701. If you believe you have been injured in some way by this research, you should also contact the Hahnemann University Research Administration Office at (215) 448-3453.

11. **Consent to use Research Results and Confidentiality of Records:** As a participant in this research study, you are giving permission for Hahnemann University to keep, preserve, publish, use, or dispose of the results of the research study. In any publication of the research results your identity will be kept confidential. There is a possibility that records which identify you may be inspected by the research sponsor, the Food and Drug Administration, or other agencies as required by law.

12. **Participant Certification:** You hereby certify that you are between 18 and 60 years of age. If you are under 18 or over 60, do not sign this consent form. Please tell the person who gave you this form that you are not eligible to participate in the study.

BY SIGNING THIS FORM, YOU ACKNOWLEDGE THAT YOU HAVE BEEN INFORMED OF THE REASONS FOR THIS STUDY, AND THAT THE STUDY HAS BEEN CAREFULLY EXPLAINED TO YOU. PLEASE BE CERTAIN THAT ALL OF YOUR QUESTIONS HAVE BEEN FULLY ANSWERED BEFORE SIGNING. REMEMBER, READ THIS CONSENT FORM CAREFULLY, AND IF YOU WISH, YOU WILL BE PROVIDED WITH A COPY.

DATE	PARTICIPANT
WITNESS	INVESTIGATOR OR DESIGNEE

Appendix S

Study 3 Interview Questions

The purpose of this study is to help us learn more about how methadone maintenance clients view the problem of drug use and how they change drug using behaviors. Earlier, you filled out a series of questionnaires relating to these topics. Today, I want to spend some time talking to you about some of the things that questionnaires don't really get at. I'll be asking you some simple and straight-forward questions to provide some information about your background. But I also want to ask some more open ended questions to give you a chance to tell me about your experience. The interview should take about an hour.

1. Identifying Information

a. Age _____ Martial Status_

b. Tell me about the family you currently live with.
(Do you have any kids?)
(Whom do you live with?)

c. How long have you been on this program?

2. Vocational Status

a. How far did you get in school?

b. What kind of work do you do?
(Do you work outside the home?)

c. Are you working now?

d. What is your longest period of regular employment?

e. How are you supporting yourself now?

f. How do you spend your free time?

3. Psychiatric History

Have you ever had any kind of treatment for psychological or emotional problems?
(If yes, when? What kind of treatment? Any medication?)

4. Medical History

Have you ever had any serious medical problems?

5. Legal History

Have you ever been arrested or spent time in jail?
(If yes, when, how many times, what charges, how long in jail?)

6. Tell me about what it was like for you, growing up in your family.

a. Brothers, sisters

b. Anyone else in the family have a problem with drugs or alcohol? Anyone have emotional or psychological problems?

c. Were you ever abused - physically, verbally, sexually.

d. How would you describe your mother and father (then and now?)

e. How often do you see your parents now?

7. Social History

- **a.** Tell me about the important people in your life. (Any friends you can confide in?)
- **b.** How do (would) they feel about your drug problem?
- **c.** How do (would) they feel about you being in treatment here?

8. What was going on in your life at the time you began using drugs?

- **a.** Which drugs at what ages?
- **b.** Family's reaction?
- **c.** What was going on at this time that was difficult for you?
- **d.** What do (did) drugs do for you? Describe the feeling that drugs gave (give) you.
- **e.** What role do you think drugs play (ed) in your life?

9. History of previous treatment

- **a.** Tell me about your previous experience in treatment?
- **b.** Why did you discontinue treatment?

10. History of abstinence and relapse

- **a.** What is the longest period of time during which you didn't use any drugs.
- **b.** What was going on in your life at that time?
- **c.** What kinds of things did you do to help yourself stop?
- **d.** Why do you think you went back to using drugs? What was going on in your life at that time that contributed to your relapse?

11. What led you to seek treatment at this clinic when you did?

- **a.** How long ago?
- **b.** What was going on in your life at that time?

12. Tell me about your treatment here at this clinic.

- **a.** What kinds of things (if any) have changed for you since you began treatment?
- **b.** What has happened to your drug use?
- **c.** What have been the most important or helpful aspects of your treatment?
- **d.** What aspects of your treatment have been the least helpful?

13. Counseling

- **a.** What has counseling been like for you?
- **b.** What kinds of things do you talk about?
- **c.** What purpose does counseling serve for you?

14. Treatment goals

- **a.** What would you like to accomplish in treatment? What are your treatment goals?
- **b.** Have your goals stayed the same?
- **c.** What have you been doing to achieve those goals?
- **d.** What have been the biggest obstacles in the way of achieving those goals?
- **e.** How long do you think it will take to achieve those goals?
- **f.** How optimistic are you about your chances of achieving your goals?
- **g.** What kind of treatment do you think would help you most?

15. Is there anything that you think I should know that I haven't asked you?

16. Do you have any questions for me about any aspect of the interview?

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BIOGRAPHY

Born in Denver, Colorado on August 27, 1961, Mark Belding grew up in the Seattle area in Washington State. He received a B.A. in English Literature from Swarthmore College in 1983. He received an M.A. in psychology from Duke University in 1987 and completed a pre-doctoral internship at New York's Beth Israel Medical Center in 1990. He received his Ph.D. from Duke University in December 1993. Since September 1991, he has worked for Hahnemann University's Division of Addiction Research and Treatment in Philadelphia, serving as Clinical Director of the university's methadone maintenance clinic. Honors and awards include a 1987 graduate teaching fellowship in Duke University's Department of Psychology and membership in the Phi Beta Kappa Society since 1983.

Past publications include the following:

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